Journal

OF THE

AMERICAN VETERINARY MEDICAL ASSOCIATION

Effective Teaching

AN EVALUATION of the effectiveness of teaching in our schools of veterinary medicine. Page 449

Diagnosis of Heart Disease in Dogs

A REPORT on the use of radiography for differential diagnosis of most commonly observed heart diseases of dogs. Page 458

Vaccination for Control of Swine Erysipelas

EXPERIMENTAL evaluation of culture and serum vaccination for the control of swine erysipelas. Page 468

Convention Attendance Biggest Yet

See Convention Report. Page 487

Vol. 137 October 15, 1960 No. 8

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OF THE
AMERICAN VETERINARY
MEDICAL ASSOCIATION

Vol. 137 No. 8 Oct. 15, 1960

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Correspondence

Tranquilizers in Cattle

August 24, 1960

Dear Sir:

I wish to commend you on your recent editorial in the *J.A.V.M.A.* entitled "Is Mass Use of Tranquilizers in Beef Cattle Justified?" I personally believe that this type of editorial comment by the AVMA JOURNAL is in order. I believe that it will be a valuable aid to the practitioner, and I am sure that the industry will welcome editorial comments based on sound thinking supported by sufficient scientific evidence.

I have two other references of recently reported data on this subject which you may wish to have for your files:

"Studies on Shipping Fever and Shipping Shrink in Cattle" by F. W. Boren, *et al*, published in the *47th Annual Livestock Feeders' Day*, Circular 378, May 7, 1960, page 37.

"Tranquilizer (Trifluomeprazine) for Shipment of Cattle" by Walter Woods, *et al*, published in the 42nd Annual Cattle Feeders' "*Hey Day*," June, 1960. (Iowa State University of Science and Technology, Ames, Iowa.)

s/G. C. SCOTT, D.V.M.
Assistant Veterinary Medical Director
Smith Kline & French Laboratories
Philadelphia 1, Pa.

August 26, 1960

Dear Sir:

In the August 15 issue of the *J.A.V.M.A.*, there is an article on page 239 entitled "Injectable Tranquilizers for Weaning and Shipping Calves."

Although the preliminary introductory paragraphs mention other ataraxics, the single drug reported on by the investigators was triflupromazine. Too, the conclusions are so general that, were they quoted without reference to the body of the paper (a not uncommon practice), they would suggest a much more extensive investigation than that which was included in the report.

(*Continued on adv. p. 6*)

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(*Correspondence — continued from adv. p. 4*).

Your usual insistence on accuracy and specificity is both admirable and justifiable. Would it not, therefore, be more desirable to entitle this paper "Injection Triflupromazine in Weaning and Shipping Calves" and to insist that the conclusions summarize the information developed in the study rather than to make general statements which mean very little?

s/R. A. Huebner, V.M.D.
Consultant Veterinarian
500 North Eagle Rd.
Havertown, Pa.

August 26, 1960

Dear Sir:

I was most interested in reading other workers' observations and comments on tranquilizers (Editorial in *J.A.V.M.A.*, 137, Aug. 15, 1960) and believe this material should be quite worthwhile for the practicing veterinarian. I believe this sort of approach to such problems is a very worthy one, and I would encourage you to use it more often in your Journal.

s/I. A. Schipper, D.V.M.
Department of Veterinary Science
North Dakota Agricultural College
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Accuracy in Terminology

August 24, 1960

Dear Sir:

With reference to your editorial, "Say It Better," page 268, August 15 Journal, I would like to remark that in almost every veterinary periodical we find the term "animal population," "bacterial population," etc. "Population" means only two things: namely, people and increase in numbers. Technically, the word "increase" following "population" is superfluous. Why speak of canine, bovine, parasitic, or bacterial population when the one-syllable word "count" meets all the requirements of the four-syllable word, "population"? After all, we speak of blood-cell counts, not blood-cell populations.

"Pathology" is as much an abstract noun as is "theology" or "psychology." The actual disease is or should be called a "pathiasis," differentiating fact from opinion, the tangible from the intangible. If I examine an animal when no one else is present and I find a tumor, I can make a diagnosis of a pathological condition, but I do not find any pathology unless I talk to myself, which isn't likely. "Path*ology*" is disease talk or *log*us. There is no di*alog*ue between me and the tumor.

The terms "trichiniasis," "ascariasis," "trichomoniasis," and "filariasis" mean that these conditions exist, without attempting to state whether the condition is progressive or regressive. In our first introduction to histology, we were obligated to study mitosis, which means the microscopic proliferation of threadlike structures. In *Hexamita meleagridis*, we find a protozoa with six flagella (mitae). "Hexamitosis" (6 hairs) would mean the increasing number of hairs, threads, or flagella in multiples of six. Since, in regard to disease, we are concerned only with the presence of the parasite, the correct term for the disease is "hexamitiasis."

It seems to be an accepted procedure to classify tumors as malignant or benign. The heteronym of "malignant" is "benignant," or "benign" as opposed to "malign." A malign condition can be expected to become worse or malignant. A benign condition indicates a benefit which may become more or less beneficial or benignant. No human being with a "benign tumor" would thank a "benign providence" for a tumor. Since tumors are not beneficial, the classification should be malignant or nonmalignant.

s/F. D. Egan, D.V.M.
Portland Veterinary Hospital
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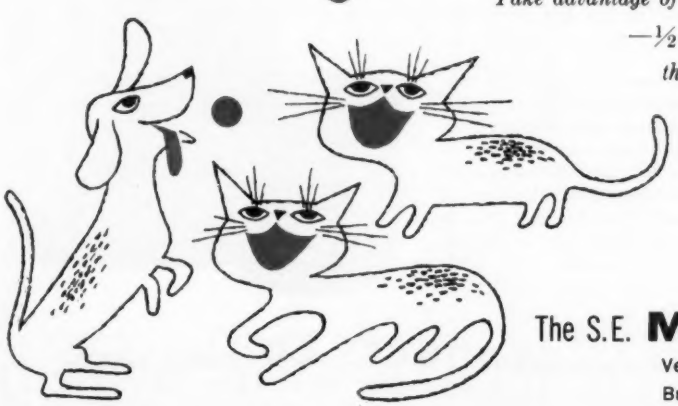

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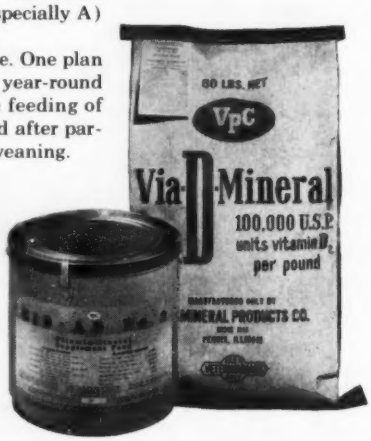

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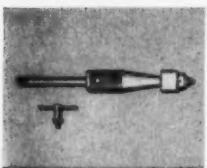

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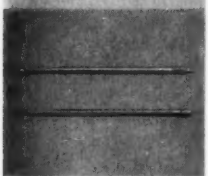

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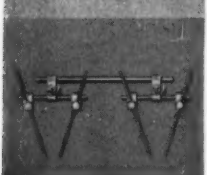

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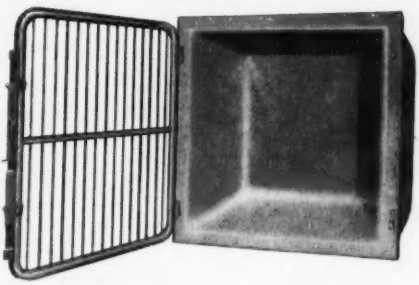

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news from Washington . . .

FROM THE AVMA WASHINGTON OFFICE
J. A. McCallam, VMD
Brig. Gen. USA (Ret.)

LEGISLATIVE

The following bills have become public laws:

Hall of Fame *P.L. 86-680, (H.R. 5789)*, to incorporate the Agricultural Hall of Fame.

Fish and Wildlife *P.L. 86-686, (S. 1781)*, to facilitate cooperation with federal government in unit programs of research and education relating to fish and wildlife.

Shipment of Animals *P.L. 86-702, (H.R. 10598)*, to clarify provisions of the criminal code relating to importation or shipment of injurious mammals, birds, amphibians, and reptiles; and to transportation or receipt of wild mammals or birds in violation of state, national, or foreign laws.

Appropriations *P.L. 86-703, (H.R. 11390)*, appropriations for Departments of Labor and HEW, fiscal 1961 (see JOURNAL Oct. 1, 1960 adv. p. 10).

Public Health Grants *P.L. 86-720, (H.R. 6871)*, authorizes project grants for graduate training in public health.

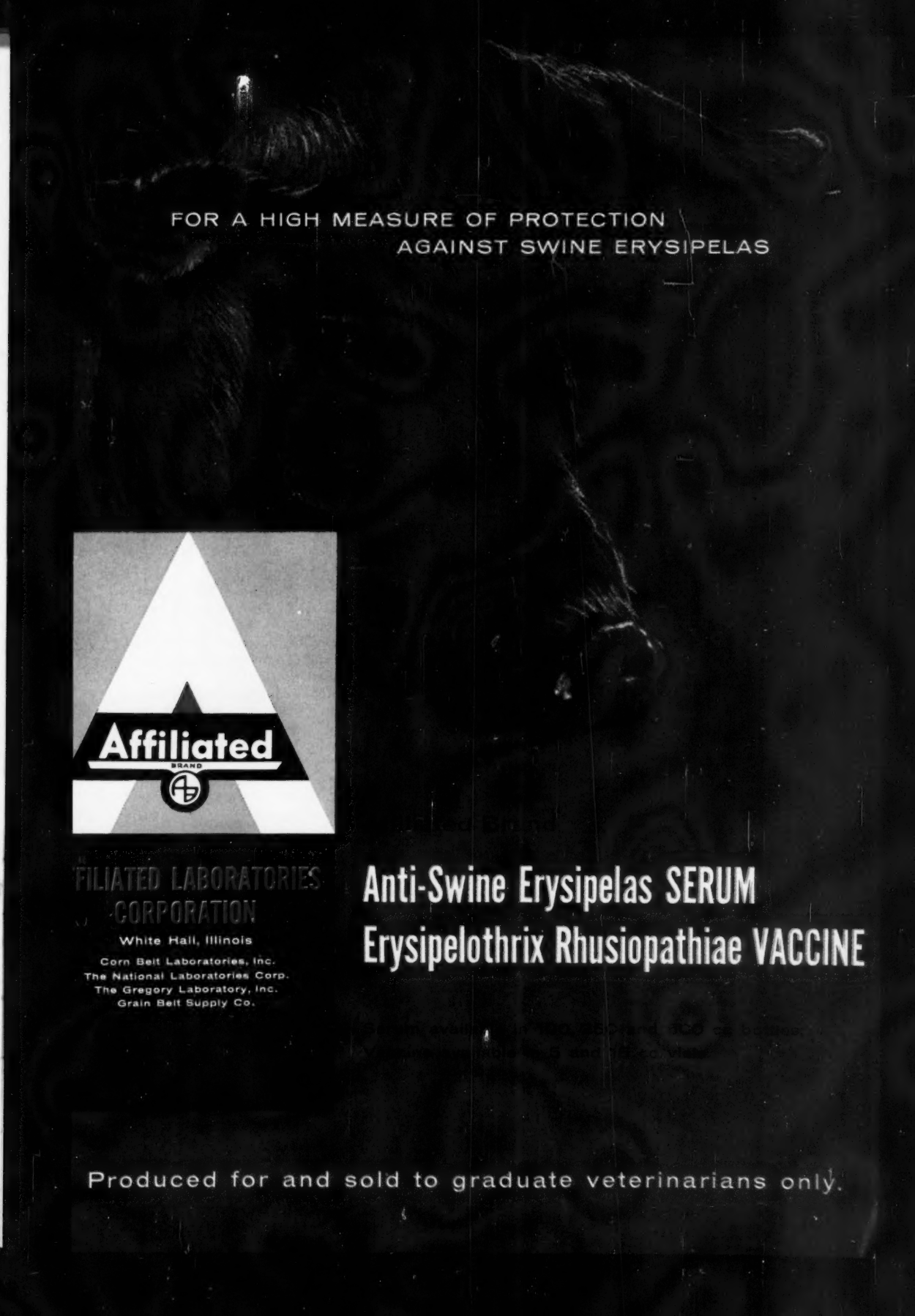
Supplemental Appropriations *P.L. 86-722, (H.R. 13161)*, second supplemental appropriations fiscal year ending June 30, 1961.

Health Act *P.L. 86-724, (S. 2575)*, Retired Federal Employees Health Benefits Act. The program provided takes effect July 1, 1961.

Copyrights *P.L. 86-726*, relates to actions for infringements of copyrights by the United States.

Social Security *P.L. 86-778, (H.R. 12580)*, Social Security Amendments of 1960 (see JOURNAL Oct. 1, 1960, adv. p. 10).

Continued on adv. p. 12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PHS Amendment

P.L. 86-798, (H.R. 10341), amends PHS Act to authorize grants-in-aid to strengthen programs in research and research training in sciences related to health (see JOURNAL Oct. 1, 1960, adv. p. 10).

MISCELLANEOUS

PHS Examinations Begin January 31

United States Public Health Service has announced examinations for appointment in various branches of its commissioned corps, *including veterinarians*. The examinations will be held in various cities from Jan. 31 to Feb. 3, 1961. Further information and application forms may be obtained by writing the Surgeon General, Public Health Service, Dept. of Health, Education, and Welfare, Washington 25, D.C. *NOTE: Completed application papers must be received in Washington not later than Dec. 2, 1960.*

Army Surgeon General's Office Reorganized

First major reorganization since 1948 of the Army surgeon general's office, announced Sept. 6, 1960, is result of one-year special study. Principal effect is the formation of four major directorates, and a comptroller (latter on directorate level). Disvisions and separate offices having related functions comprise an appropriate directorate.

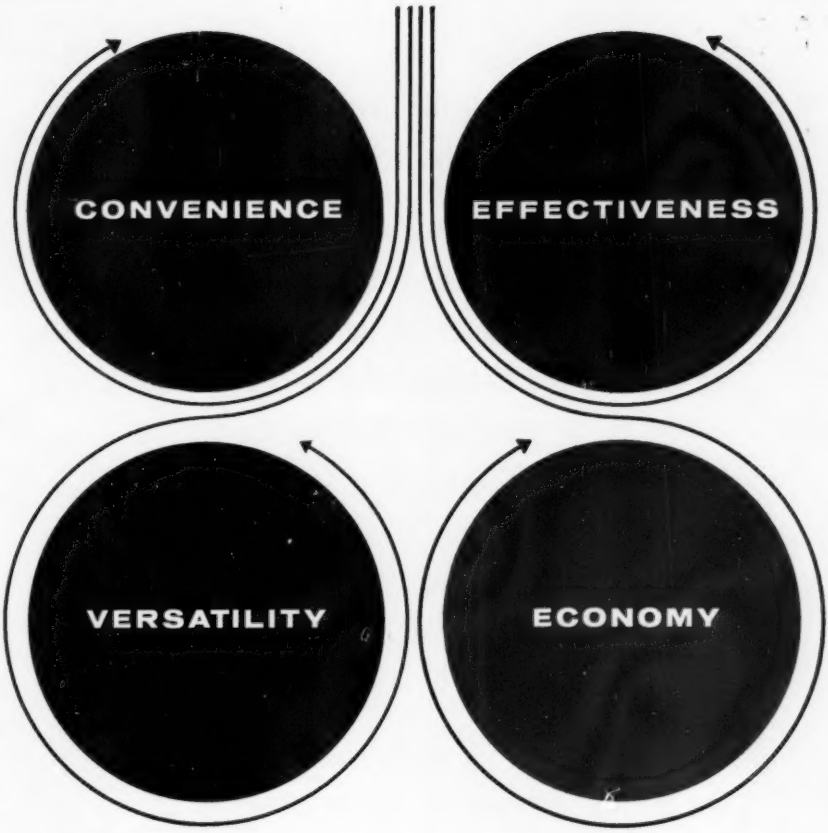
The titles of the two divisions headed by general officers, dental and veterinary, now designated as "Assistant for Dental Services," and "Assistant for Veterinary Services," respectively. As formerly, both have direct access to the surgeon general.

Dr. Somers Succeeds Dr. Pals in USDA Division

Dr. Robert K. Somers was appointed associate director, Meat Inspection Division, USDA, effective Sept. 1, 1960. He succeeds Dr. C. H. Pals. Dr. Somers has been with the department on various assignments since 1936, coming to the Washington office in 1947 as assistant to the chief of the Meat Inspection Service.

Veterinarians Work on Space Project Mercury

Twenty-one Army and Air Force veterinary officers have been assigned to animal recovery operations of "Project Mercury." They are to assist in the training and other support necessary to put certain animals into space prior to the launching of the first astronaut in the Mercury capsule.



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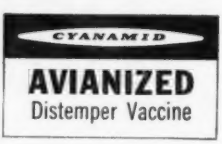

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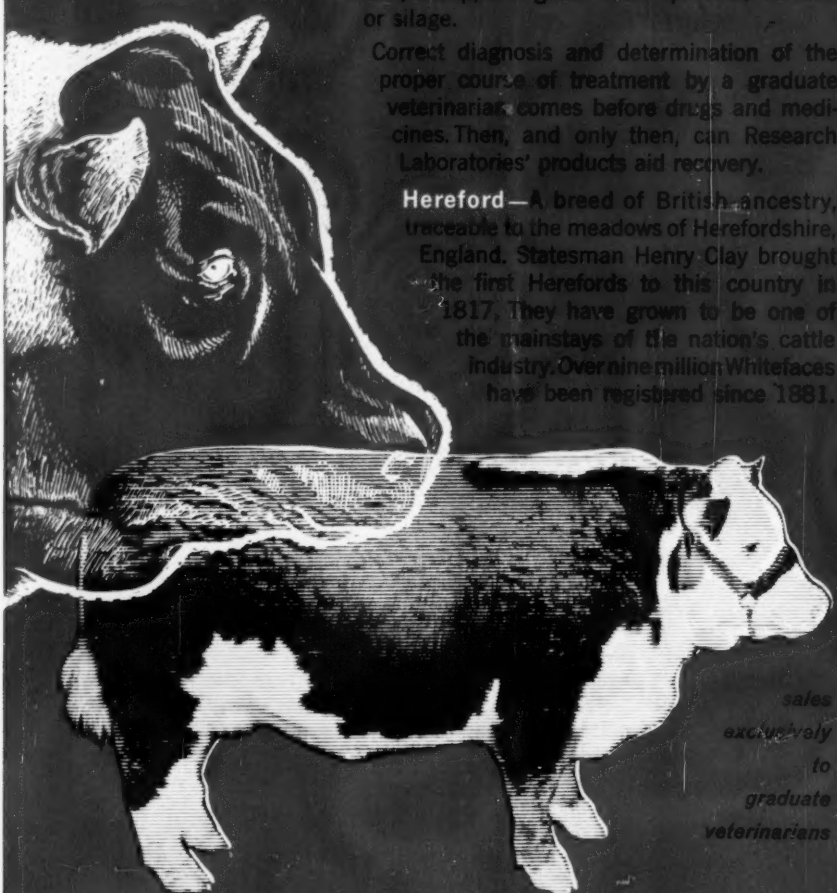

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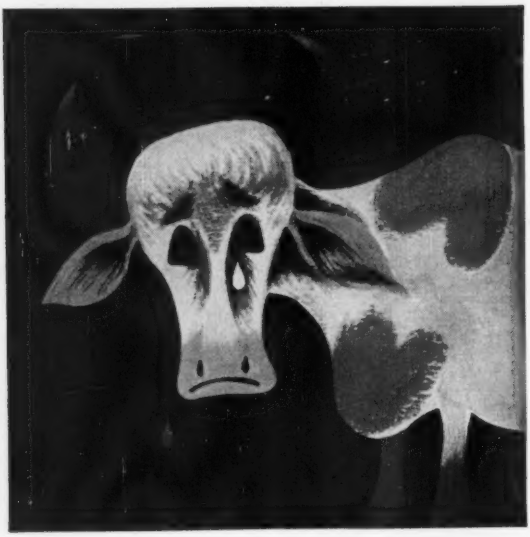

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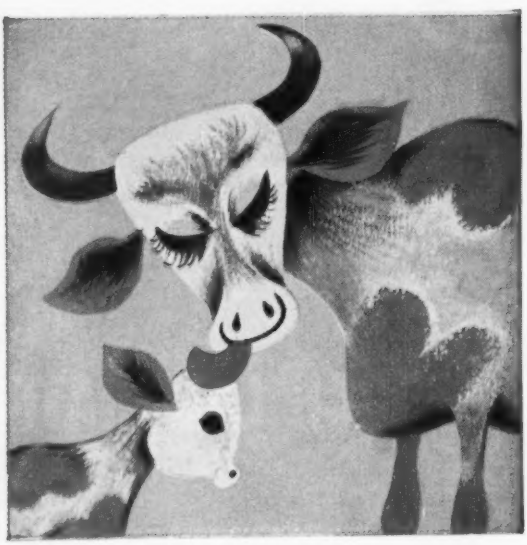

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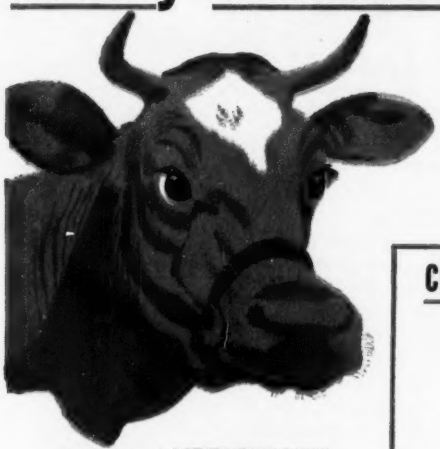

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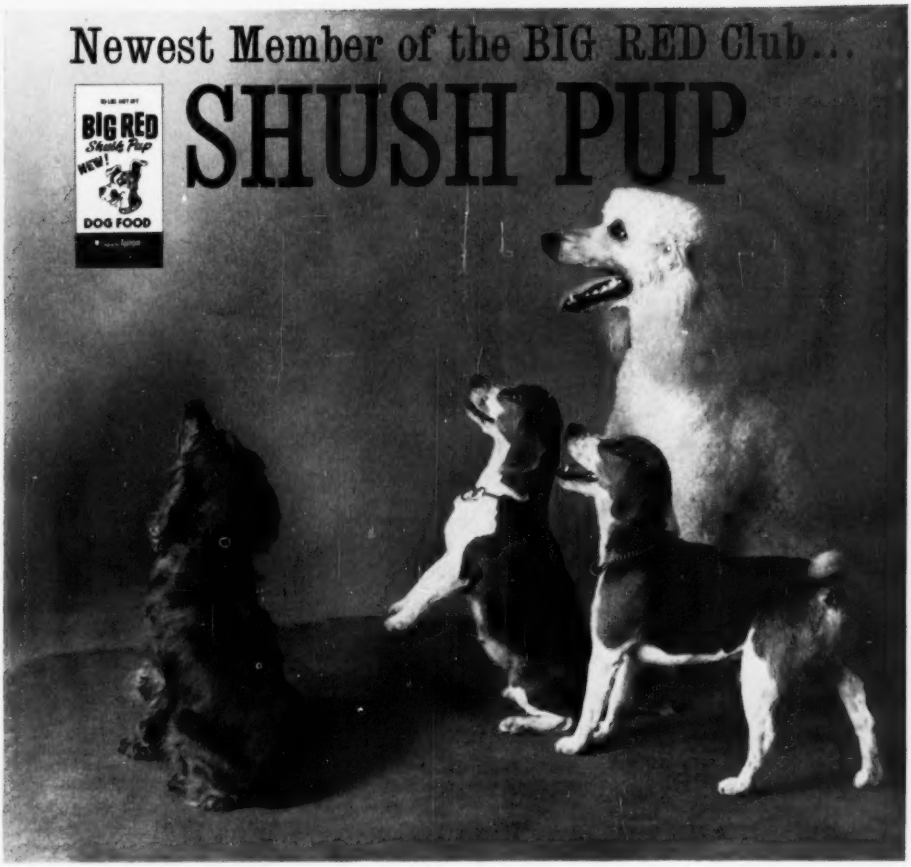

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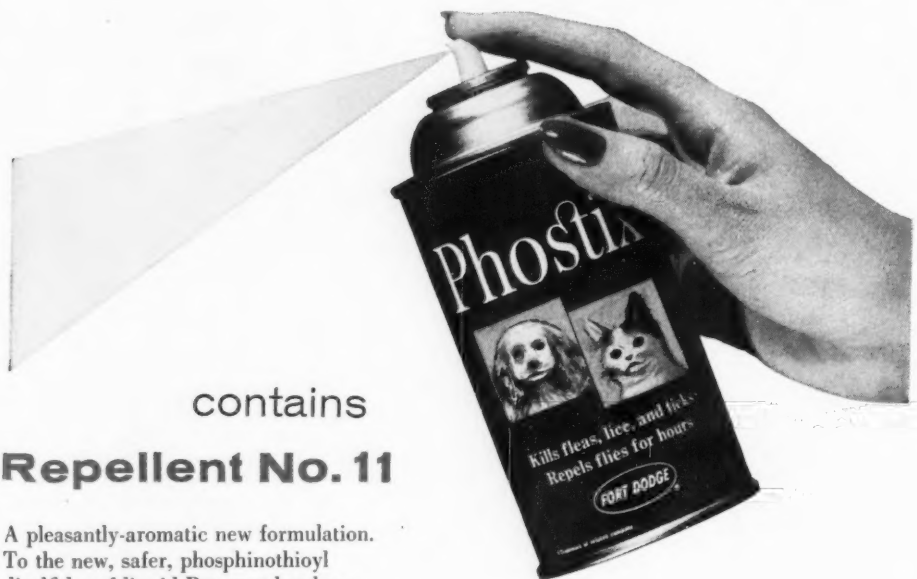

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Journal

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Effective Teaching

in Schools of Veterinary Medicine

David E. TYLER, D.V.M., M.S.
George C. CHRISTENSEN, D.V.M., PH.D.

WHILE obtaining a formal education, almost everyone encounters instructors who are unable to convey material to their students. Such instructors may be hampered by the delusion that teaching should assume a secondary role to research or by an unawareness of the proper approach to effective teaching.

Poor instruction appears to be common in American higher education. According to the report[10] of the President's Commission on Higher Education, "College teaching is the only major learned profession for which there does not exist a well-defined program of preparation directed toward developing the skills which are essential for the practitioner to possess." Since graduate schools are the principle source of college teachers, it appears that they are not meeting their responsibilities in this area. Most writers on the problem of poor teaching suggest that this is the case. For example, one author[2] believes that the traits that contribute to poor teaching are a direct result of a teacher being trained for specialized research, rather than for teaching. Defenders of the present graduate program point out that the primary objective of graduate training is to produce research workers. Some authors feel that this is not realistic in light of the actual use that graduates make of their training. Studies have shown that over 50 per cent of the Ph.D. graduates in all fields become at least part-time teachers, whereas fewer than 50 per cent become engaged in research alone.[1,2,6,9]

From the Department of Veterinary Science (Tyler) and the Department of Veterinary Anatomy (Christensen), School of Veterinary Science and Medicine, Purdue University, Lafayette, Ind. Dr. Tyler is now assistant professor of veterinary pathology, Iowa State University, Ames.

Graduate Schools

Some college administrators charge that college teachers are ineffective mainly because of inadequate training for teaching. On the other hand, many graduate schools either deny that a problem exists or are of the opinion that teacher preparation has no place in their program. One educator[8] believes that the source of contention can be found in an evaluation of the component parts of higher education; namely, research and scholarship. He defines research as "the effort to discover new facts or recover lost or forgotten facts: it is the empirical element in the quest for understanding the nature of the universe and man." Scholarship on the other hand is "the organization, criticism, and interpreta-

tion of facts: it is the rationalistic element in the pursuit of understanding."

The esteem that these two activities have enjoyed has varied during the course of the development of American higher education. Prior to 1880, the attitude of most educators favored scholarship (teaching) and left research to the academies. With the increasing influence of the German universities, research became more and more popular. At the turn of the century, the existing philosophy of higher education had made a complete reversal. Research became the primary function of the schools while teaching became subordinate to it.

Apparently most educators fail to make the proper distinction between these component parts of higher education. They have not been able to recognize that research *per se* has only indirect relationship to teaching, and that it must rely upon scholarship to assemble, evaluate, criticize, and communicate its efforts to college students. The fact that scholarship must rely upon research to continually supply it with material in order to develop meaningful, worthwhile courses of instruction has often been equally overlooked.

The situation in professional schools is generally no better than in other fields of higher education. It has been said that many of us do not know what we are doing as teachers, that those of us who do, learned to teach accidentally or by extraordinary efforts and generally find it difficult to communicate it to others.

For many years, educators have been alarmed at the quality of teachers being produced by graduate schools; however, little was done about the situation until after World War II. Stimulated by such works as the report of the President's Commission on Higher Education[10] and the ideas set forth in "Education and World Tragedy,"[7] educators throughout the country are exposing the problem of ineffective college teaching and are proposing to alleviate it by various techniques. An increasing number of graduate schools are heeding their advice and establishing programs for teacher development. These programs vary not only in design, but also in the degree to which they are utilized. One or more of the following methods are used by these schools.[3,5,8]

Fellowships are made available to outstanding students having interests and abilities for college teaching.

Broadening of the Ph.D. degree requirements in the interest of prospective teachers varies from the substitution of teaching courses for a foreign language requirement to specific graduate programs for prospective teachers.

Apprentice teaching has been widely used for years. It is only recently, however, that a few schools have placed it under adequate supervision.

Following up graduates to see how well they are doing as college teachers is used by only a few schools.

A systematic study of the problems of college teaching is usually made through such devices as workshops, seminars, or specific courses in teaching methods.

A few of the graduate schools have established committees for the purpose of developing interest in teacher improvement in all departments.

Although some progress has been made, the number of schools participating in such programs is still small, and the programs generally involve only a few departments rather than the entire graduate school.

Veterinary Questionnaire

So far we have dealt with graduate schools in general. What, specifically, is being done by veterinary schools to improve the quality of their teachers? In December, 1958, a questionnaire was sent to all the deans of the veterinary schools in the United States and Canada. Seventeen of 20 were returned. The following is a discussion of some of the more pertinent data obtained from the questionnaire.

During the past 5 years, 60 per cent of the veterinarians awarded advanced degrees became engaged in college teaching and research, 15 per cent in research exclusively, 13 per cent in industry, 8 per cent in practice, and 4 per cent entered governmental services. It appears that more serious thought should be given to the inclusion of a teacher preparation program in the graduate plan of study.

Several questions were asked about graduate course offerings in the theory and practice of teaching. Nine replied that such methods were used to inform graduate students of the problems and techniques of college teaching. Since a question asking for the number of students who actually took such courses was not included in the questionnaire, only an estimation of the

activity of such programs can be made. They all replied that these courses were optional and six stated that the courses were given by the education department.

Teaching experience for graduate students is provided primarily through their work as laboratory assistants. Some gain additional experience by teaching a specific area of a course. Half the schools indicated that supervision of the instruction was an irregular occurrence. The other half stated that the supervision was a scheduled and definite program. All indicated that completion of formal courses in the theory and practice of teaching was not required of a graduate student.

Although 14 deans indicated that faculty promotions were based on effectiveness of teaching, only 9 stated the method of teacher evaluation used. Student evaluations of teachers were most commonly employed. In one instance, a faculty committee was utilized to evaluate teaching effectiveness.

Five schools provided means whereby recognition was given for outstanding performance in teaching.

During the past five years, 62 per cent of the teaching personnel for veterinary schools was obtained from students engaged in graduate studies and from recipients of advanced degrees; 24 per cent came from private practice, 8 per cent from recent recipients of the D.V.M. degree, and 2 per cent each from industry, governmental services, and nonveterinary fields.

A Possible Approach

The most encouraging finding of the questionnaire was the great amount of interest that is developing in the area of teacher improvement. It is possible that the following procedures, long advocated by professional educators, may be of value in planning a program of teacher training in schools of veterinary medicine.

1) *Selection.*—In 1948, there were 87 students engaged in graduate study. By 1958, this number had risen to 252, nearly a 300 per cent increase.[4] If present trends continue, a large majority of these students will look toward teaching as a possible career. Veterinary deans and department heads should be able to be more restrictive in selecting their teachers.

In the selection of teachers, several qualities are considered important. The two most essential are:

A) Desire for Teaching.—Often, the difference between a good and a poor teacher can be measured in the amount of enthusiasm displayed for the subject matter specialty, the field as a whole, and for the students.

B) Knowledge of the Subject.—The prospective teacher should be potentially well grounded in his subject and in related areas. A teacher with a shallow background can only produce inadequately informed students. As has been pointed out,[5] the good teacher is "one who continuously organizes, criticizes, and interprets the data, new and old, of his subject—in short, one who is a scholar."

2) *Preparation for Teaching.*—Many of our teachers are unable to properly communicate their knowledge to their students. This is usually not an inherent weakness of the teacher, but what may be expected of one entering a field for which he does not have the necessary training. In the veterinary profession, the practitioner, the research worker, and the teacher have in common a well-developed background in veterinary medicine in general, yet each of them needs special additional training to successfully perform in the area in which he is to work. We provide such training for the practitioner and the research worker, but so far we have neglected the training of the teacher.

The best time for preparing teachers seems to be during graduate training. It is during this time that the prospective teacher generally has the opportunity to start applying the principles of communication. One practical method in attaining these principles is through a course in the theory and practice of teaching. Such a course might consider the following areas:

A) The History and Evolution of American Higher Education.—The value of history is self-evident. History gives us a background on which to build an understanding of the problems that confront us today. In addition, knowledge of the colorful history of veterinary medicine should tend to add infectious enthusiasm to the teacher's presentations.

B) The Organization and Administration of Higher Education.—In order for a teacher to perform at his maximum ability it is important that he understand his role in fulfilling the overall objectives of the institution of which he is a part. This can best be done by studying the objectives of various institutions and the types of organizations that have been developed to carry out these objectives.

C) The Practice of Teaching.—This phase of the course might deal with an investigation into the techniques of teaching. It might also provide for a practical application of these techniques.

In other words, students could give practice lectures and laboratory demonstrations. It is here that the prospective teacher should learn the principles of organization of his material and develop the ability to hold the interest of the students.

D) Testing Techniques and Evaluation of Tests.—Testing is generally one of the most misunderstood and poorly practiced phases of teaching. Application of the correct principles of test construction and evaluation contributes greatly toward improving the effectiveness of a teacher.

E) Student Counseling.—To get the best efforts from students, teachers should make an attempt to understand them and their problems. Student counseling is an important part of a teacher's duties. Instruction in the psychology of education is desirable.

Probably the most important phase of teacher preparation ultimately comes in the application of the principles of teaching under a system of supervised apprenticeship. The supervisor should make regular visits to the beginning teacher's classroom and counsel with him afterward, pointing out errors and possible means for improving his effectiveness. Teaching by graduate students during this period should be considered a valuable training ground and not, as is often the case, a means of providing cheap instruction for undergraduates.

3) *Attitude of the Administration Toward Teaching.*—Potentially good instructors are encouraged to improve their effectiveness when administrators reward their efforts. Although the products of teaching are not as easy to evaluate as the publications resulting from research, similar consideration acts as an added stimulant to the teacher's desire to improve his usefulness.

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Few Anatomy Books Written for Veterinary Students

All the best textbooks on mammalian anatomy and embryology are written for medical students. The various adaptations relating to upright posture and more subtle difference due to precocity in development of many organs are not necessarily emphasized by the authors, for their subject matter is man. For the veterinary student, these differences are a source of confusion, and time has to be consumed in interpreting them in terms of domestic animal anatomy.

A medical student has another advantage over a veterinary student. He carries with him a living textbook. To a nonmedical observer, the behavior of medical students while making an oral examination is interesting. All but the weaker candidates will make repeated reference to their own bodies when in the process of answering questions. Their examiners probably barely notice this, except to remark its absence in the poor candidates. Although it has obvious restrictions, mainly to surface structures, it is, nevertheless, a means of knowing living anatomy that many a medical man almost certainly makes use of throughout his professional life. —*Nature, 186, (April 16, 1960): 192.*

Veterinary Problems in

Artificial Insemination

David E. BARTLETT, D.V.M., PH.D.
Lester L. LARSON, D.V.M., PH.D.

DURING the past 20 years, rapid growth and wide acceptance of artificial insemination (AI) has exerted significant impact upon practices for breeding cattle in this country. An intriguing basic technique originally brought to the United States from Denmark, AI has advanced to a high degree of technical perfection and practical utilization. Research workers of many countries, businessmen and cooperative organizations with vision and capital, and practical enthusiasts have contributed their efforts in developing, improving, promoting, and applying AI in the barns, pens, and corrals.

History

Some sound and successful AI organizations have been able to develop and survive during these phases. In its first decade, AI was characterized by mushrooming of hundreds of small, local interest studs which suffered disappointment and failure. The total of semen-producing organizations reporting to the Dairy Herd Improvement Association, USDA, reached a peak in 1950 and has declined since then; there is clear evidence of a continuing decline, for obvious economic reasons.

In most parts of the United States, AI has achieved a well-established, stable, and relatively competitive status. A 7 million-cow volume involving one third of the dairy cow population exists, and an atmosphere of continued expansion prevails. Growing interest and confidence in the possibilities for insemination of beef cattle are widely evident.

The path of progress for AI toward a state of good public understanding and acceptance has not been smooth. Many points and questions have been raised to which replies could not always be immediately provided.

Of these, some were serious whereas others were ridiculous. Some were spawned in ignorance, others in desire to harass. Some must have been intended to confound.

It was seriously proposed that artificial insemination was a crime against nature; that the natural libido of cattle would suffer and disappear; that homosexual characteristics would develop in both sexes; that unnatural matings not controlled by animal instincts would result in deteriorated offspring (a sort of bovine idiocy); that calves born in posterior presentation were the fault of the inseminator having put the semen in backward; that cows would become allergic to semen extender and, in consequence, infertile; that calves might be born with feathers because of the use of egg yolk in the extender; that AI calves would be weak and that heifers so born couldn't be successfully inseminated themselves; that it was not possible to inseminate a cow for each of her successive pregnancies, making it necessary to return to use of natural service after a year or two; that it was imperative to keep a bull close to the herd to maintain sexual instincts of the females; that the usual sex ratio was altered and that mostly bulls were born from AI; and that first chilling, and later freezing, semen would cause destructive genetic mutations.

When a breeding problem was encountered in an artificially inseminated herd, a common recommendation made was that a bull should be obtained. Too often this recommendation came from a veterinarian and frequently it was after little or no investigation.

Artificial insemination has assumed a burden; it has placed written records of reproductive performances in more than 100,000 barns. For the first time, facts concerning failures occurring in bovine reporduction became widely evident. No bull had ever left a written record and collected a cash fee for services rendered, nor had a bull been obliged to receive complaints. An inseminator technician was present and he had to face and cope with the complaints.

Today tens of millions of normal calves have been born from AI. There are outstanding cows that represent up to 8 or 9 generations of exclusive AI, and there are herds of cows with high fertility that have not seen a bull for 10 or more years.

In the largest single dairy operation in the United States, all cows have been bred by AI exclusively

From the American Breeders Service, Chicago, Ill., and Madison, Wis.

Presented by the authors at the 96th Annual AVMA Convention, Kansas City, Mo., Aug. 23-27, 1959.

TABLE 1—Artificial Insemination Statistics—In Each of These 9 States, More than 250,000 Cows Were Bred Artificially in 1958

State	No. cows bred artificially
Wisconsin	1,214,124
Minnesota	580,966
New York	551,741
Pennsylvania	504,215
Ohio	367,964
Iowa	365,647
California	319,699
Michigan	307,328
Illinois	271,195

for almost 10 years, the herd has been expanded from 3,000 to 8,500 head—not, however, through natural increase alone. Artificial insemination has provided reproductive efficiency in large cattle populations equal to that of natural service.

Expansion of AI has been rapid and, at times, hectic. The formative phases occurred during World War II when a shortage of veterinarians was particularly severe. Futhermore, most veterinarians of this country had received poor training in the field of reproductive physiology, pathology, and pertinent clinical practices; many were simply reactionary. As growth progressed, the relationship of AI to veterinary medicine and veterinarians varied from cordial to hostile, and participation of veterinarians in AI from total to tenuous or erratic.

Most AI organizations operating today have established themselves with a minimum of participation by veterinarians. Research contributions to the field of AI by veterinarians of this country are becoming even more conspicuous by their scarcity. The usual attitude of veterinarians toward AI is one of tacit acceptance.

Objectives and Advantages

However, let us not lose ourselves in the contemporary scene. To firm our professional relationships and develop sound, realistic, mutually beneficial attitudes toward the AI industry, we should first clarify our thinking by a consideration of AI benefits. What are its true objectives and accomplishments? Where does veterinary medicine fit into this picture?

The principal objective of AI should be the economical, mass genetic improvement of cattle through selection and wide utilization of a limited number of males chosen in the most scientific manner possible for their abilities to transmit genetic characteristics of economic importance. Artificial insemination should improve prolificacy of a population of cattle by providing the male factor in fertility at a constant high level through exclusive use of bulls of established high fertility that are free from diseases that destroy or depress fertility.

Of course, there are additional incidental benefits: Since there is no bull in the artificially inseminated herd making sexual contacts, there is no intraherd transmission of venereal disease; an essentially nonproductive animal need not be maintained, the labor involved being spent more productively; a dangerous animal responsible for many serious injuries and deaths on the farm is eliminated.

These objectives and advantages are all good. Insofar as AI accomplishes them, AI is good. Preponderantly, the record of AI in the United States appears to have been satisfactory.

But whenever AI has resulted in spread of disease faster and wider than otherwise, then AI is bad. Surely, nothing good can be said for the use of bulls of subnormal or uncertain fertility. Attempting, through AI, to obscure or compensate for these deficiencies is ridiculous.

What can be said for use of bulls in AI that offer no promise of genetic improvement?

Veterinary medicine and veterinarians have 5 major areas of relationship with the artificial insemination industry. These are:

1) *Animal Disease.*—Artificial insemination can be our most valuable and practical weapon in the control and eradication of certain important animal diseases, but, if our actions are indifferent or negative, the ultimate effect of the technique is reversed and disease will be spread rapidly and widely. Control of disease is a problem and responsibility of veterinary medicine.

The facts of the AI-animal disease relationship are common knowledge.

It has been demonstrated many times that bulls with vibriosis and trichomoniasis transmit these venereal infections readily to females when raw semen is used for insemination. Bulls that are "shedders" of *Brucella abortus* readily transmit this infection to females through artificial insemination. The theoretical bases for transmission of leptospirosis is obvious, as is the possibility of transmission of tuberculosis. The USDA has prohibited the entry of semen into the United States from countries where foot-and-mouth disease virus exists, because this virus may be present in semen and it is able to resist the processes employed for short-term or long-term preservation of sperm.

In the conduct of AI, all these diseases except vibriosis must be controlled through the use of bulls established as disease-free and so maintained. Vibriosis represents an unfortunate exception in that reliance must be placed upon exact semen-processing methods involving incorporation of antibiotics, extension ratio, and the factor of time.[5] Practical and reliable methods for diagnosis of vibriosis in bulls simply do not exist and treatment techniques are in experimental stages.

Generally speaking, freezing semen does not materially minimize the danger of disease transmission, since pathogens have survived the physical and chemical conditions involved in freezing for significant periods. Semen freezing created additional problems since the efficacy of processing methods acceptable for control of vibriosis in chilled semen was grossly altered. Transmission of vibriosis to heifers by antibiotic-processed frozen semen has been reported.[1,7,8] Recent work[4] supports the contention that semen, processed and frozen under specified conditions, may be as safe as properly chilled semen from vibriosis-infected bulls. But these conditions for inhibiting or destroying vibriosis are exacting. If these conditions do not prevail, transmission may occur.

Veterinarians involved in private inter- or intraherd insemination should keep the foregoing facts and principles in mind. Shipping of semen on a custom basis is becoming increasingly common. Any reduction in standards for health of bulls and for semen processing means increasing the probability of disease transmission, even though the infection potential in such circumstances is relatively lower than in large scale AI.

Recognition of the possibility for great harm from disease transmission through AI prompted the development of the AVMA-NAAB (National Association of Artificial Breeders) Code of minimum standards for health of bulls used in AI. This was developed in 1953 by the AVMA, was adopted in 1954 by the NAAB, and was modified and adopted by both organizations in 1957.[2]

This effort should be recognized exactly for what it is—a statement of absolute minimum standards, compliance with which has been on a wholly voluntary basis.

Presumably, acceptance by the NAAB member semen-producing organizations has been good, although some serious incidents in which diseases have been transmitted have occurred subsequent to adoption of the Code. Surely, it has been demonstrated that it is possible to live within the principles of the Code, and that no valid reason exists for nonacceptance. The total effect of the Code seems to be constructive.

TABLE 2—Artificial Insemination Statistics—In Each of These 14 States, 40 Per Cent or More of the Dairy Cows Were Bred Artificially

State	Per cent
New Hampshire	56.0
Connecticut	53.2
Maine	52.2
Massachusetts	52.1
Washingon	51.4
Utah	51.1
New Jersey	48.8
Pennsylvania	48.5
Wisconsin	48.5
Ohio	42.9
Rhode Island	40.7
Vermont	40.5
Idaho	40.4
Minnesota	40.0

Today, a portion of the semen sold by most organizations moves interstate. The total production of these same organizations involves considerably more than 80 per cent of the semen produced in the United States. Custom freezing of semen from on-the-farm bulls is becoming more common, and this semen is sent all over the country. Some AI organizations have frozen semen from on-the-farm bulls over which they have no supervision and have included this semen within their regular AI program.

Perhaps regulations similar to those prescribed for movement of live animals should be considered. Untoward incidents have not only been serious to our livestock economy, but also detrimental to the confidence in all AI.

Artificial insemination involves inseminator contact between individual animals of a herd, as well as between herds. Development of single use, disposable plastic equipment has essentially solved the problem of intraherd contacts, provided that such equipment is routinely employed. Necessity for between-farm sanitary precautions persists. These are onerous but important routine chores.

2) *Actual Insemination of Cattle.*—Presently, at least 250 veterinarians are active in the business of insemination of cattle within the organized AI industry as regular or relief inseminators or as employers of lay inseminating technicians. Many more veterinarians provide or supervise insemination operations which are on inter- or intraherd bases.

Inseminating cattle as a veterinary practice service has been increasing. Frequently this service is incorporated within organized herd-fertility or herd-health supervision programs.

In many instances, AI has made possible earlier incorporation of a veterinary associate or partner within a practice. Often, a lay technician is employed to do all or part of the inseminations.

Today, AI is competitive and requires volume at both levels—semen producing organization and inseminator—to exist at low cost. Achieving volume necessitates promotion. This should be accomplished within the limits of acceptable ethics for veterinary practice.

A head-in-sand attitude is untenable. It is paradoxical and ironical for one aware of the historical events in development of AI to hear now that the veterinarian has no place in AI of cattle and that becoming involved in it is inconsistent with acceptable professional ethics.

3) *Professional Veterinary Counsel and Service to Cattle Owners in Respect to Breeding and Disease Control Problems.*—The veterinary practitioner must be informed in order to provide sound, unprejudiced advice. When actively participating in AI programs, it is his obligation to give consideration to all aspects of the services he renders.

Offering professional advice is predicated upon knowledge. Discrimination in the matter of AI is important. We are unable to express our thoughts on the subject better than has already been done by Dr. Stephen Roberts of Cornell University:[6]

> It. . . [is] . . . pertinent, at this time, with frozen semen being shipped all over the country, as well as fresh semen being used very widely from individual bulls and many individual herds, to call to the attention of veterinarians that diseases may spread through semen and to indicate to them that simply because semen is frozen, or has antibiotics in it, is no assurance that disease may not be present, or that semen is of good quality.
>
> I think that at the present time, veterinarians are overlooking the fact that disease can be a serious problem in artificial insemination. Since most large studs are effectively controlling diseases and thus enhancing the reputation of frozen and liquid semen most veterinarians and owners think all semen is equally as safe. The dangers inherent in semen collected from sires in privately owned herds without proper controls is great. The lack of interstate regulation of semen shipments simply adds to the dangers. These facts might well be brought out to warn veterinarians, who may be collecting semen, or may be using semen, that the source of this semen should be carefully scrutinized so that they can advise their client as to the use of this semen and the possible dangers inherent in the use of semen prepared when no controls exist. . . .

4) *Relationship with Lay Inseminating Technicians.*—There are now more than 6,000 lay technicians working in the United States. They have earned a solid place in the agricultural community through demonstrated ability to perform satisfactorily a useful function. As established allied workers, they must be so regarded and treated.

The relationship between technicians and practicing veterinarians is evolving into a harmonious state, but this relationship is often more one of toleration than cooperation. Some veterinarians have come to realize that they can gain much from competent technicians who are representing organizations carrying out sound programs of livestock improvement. Better cattle and better herd management mean better veterinary practice.

Friction, when it occurs, is usually the result of technicians infringing upon the area claimed by veterinarians or the result of veterinarians being hasty and deprecating the services performed by inseminator technicians.

Reasons for some technicians becoming involved in matters beyond insemination technique are not difficult to understand. Basically, AI technicians represent an absolute minimum of specific training consisting of a few days or weeks of empirical orientation followed by on-the-job experience under minimal or no supervision. Further technical instruction is meager. Technicians are unprepared to deal with any real disease or management problem.

These men try hard, but in the absence of regular competent veterinary service in the herds of their customers they may, in desperation and with no ability to discriminate, try anything to achieve desired results or to give the appearance of such.

They may be pressured by their farmer customers who are motivated by desired economy or who are unimpressed by the differences between AI technicians and veterinarians. Of course, occasional technicians are so carried away by their new found knowledge or minute area of simple skill that they become overenthusiastic. It is unfortunate that many overextended technicians have been led into this situation by veterinarians unwilling to provide fertility service themselves.

The veterinary practitioner is never vulnerable to criticism, or presence of an AI technician when he (the veterinarian) can competently carry out genital examinations, diagnose pregnancy, skillfully pass a tube through a cervix, select and apply rational therapeutic measures for diagnosable disorders of reproductive function, provided he is regularly offering and performing such services. And, he must be at least equally conscientious in carrying out his tasks in a manner consistent with good sanitation.

The need for sound fertility improvement programs is still largely going unsatisfied. No one else, as yet, has chosen to occupy this partial vacuum.

5) *Preparation of Veterinary Students.*—If future veterinarians are to find a role in dealing with reproductive problems of livestock, thorough preparation is essential. Knowledge of the present status of the field, reasonable skillfulness in performing common clinical procedures including genital examination and pregnancy diagnosis, and competence in and understanding of the AI technician's job are all basic. It is unreasonable to assume such knowledge will be acquired automatically subsequent to graduation. Obviously, marked differences exist in training, attitude, and competence of the graduates of different schools.

Stimulating a few good students into the field of research in physiology of reproduction and artificial insemination would be salutary for the profession.

In 1958, the AVMA Committee on Artificial Insemination and Animal Reproduction offered[3] a sound and desirable recommendation stating that a seminar limited to the appropriate members of the teaching faculties of the veterinary schools and colleges should be sponsored for the consideration of the varied problems that exist within the veterinary profession in the field of animal reproduction. Such a seminar could be valuable in assuring progress toward providing present and future veterinarians with those qualifications needed to cope realistically and effectively with trends in AI and animal reproduction as they are developing with the dairy and beef cattle industries.

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Hygromycin Affects Hearing in Swine

Hog raisers are urged by the manufacturer of the anthelmintic hygromycin to follow feeding recommendations closely when administering it to swine. Otherwise, use of the product may result in impaired hearing in hogs. Impairment of hearing probably would not create any problems in market hogs, but would make gilts and sows less responsive to squeals of baby pigs, possibly result in added death losses.—*Nat'l. Hog Farmer, 5, (1960): 9.*

Radiographic

Diagnosis of Heart Disease

in Dogs

Robert L. HAMLIN, D.V.M., M.SC.

RADIOGRAPHIC anatomy of normal dogs has been reported.[1,5,6] The purpose of this report is to describe the use of radiography for the differential diagnosis of the most commonly observed[2,7] heart diseases of dogs (mitral and tricuspid insufficiency, pulmonic stenosis, and patent ductus arteriosus).

Materials and Methods

Dogs with various congenital and acquired heart lesions were referred to the Ohio State University veterinary clinic. Radiographs were taken with 0.1-sec. exposures using 10 ma./sec. technique and 40-inch anode-film distance. In the illustrations, dorsoventral radiographs are viewed from the ventral surface of the dog; thus, the dog's head is toward the top, and the left side of the body is to the right of each figure. To illustrate the comparative value of dorsoventral and lateral radiographs for the differential diagnosis of heart disease, lateral views are included in 2 cases.

Schematic diagrams appear to the upper right in most figures. The normal cardiac silhouette, as approximated for each dog, is the unshaded area within the thorax. The enlarged portion of the heart which contributes the abnormal shadow is shaded and labeled.

Cross sections parallel to the ventral surface were obtained by freezing anesthetized dogs on their sternums and sectioning the frozen carcasses with a band saw.[11] The sections were photographed from the ventral surface, and they correspond to the views in the dorsoventral radiographs.

Results

Enlargement of the left ventricle, right ventricle, and main pulmonary artery may be seen on dorsoventral radiographs of the thorax. A radiograph and actual cross sections may be observed for a normal dog (fig. 1). The right ventricle comprises the cephalic, right-cephalic, and right borders of the cardiac silhouette. The left ventricle comprises the caudal, left-caudal, and left borders. The main pulmonary artery comprises the left-cephalic border. Normally, the left-caudal cardiac border is slightly closer to the left rib cage than is the right-cephalic border to the right rib cage. The right and right-cephalic borders are rounded; the left-cephalic border is obtusely angulated; and the left border is relatively straight.

In the upper right corner of the radiograph, the schematic diagram of the normal cardiac silhouette contains arrows originating from the ventricular and pulmonary artery lumina, as labeled, and extending in the direction that the corresponding chamber or vessel would enlarge as a result of common pathologic conditions. It is apparent that right ventricular enlargement would extend the cardiac shadow cephalad and to the right, left ventricular enlargement would extend the shadow caudad and to the left, and pulmonary artery dilatation would cause the shadow to bulge cephalad and to the left, forming a nearly 90-degree angle between the cephalic and left cardiac borders.

Dorsoventral radiographs characteristic of each of the most commonly observed congenital and acquired heart diseases of dogs are shown (fig. 2-7). Pathogenesis of the cardiac enlargement observed in each pathologic condition is described elsewhere.[3,8-10] A summary of the salient radiographic and auscultatory findings for each lesion appears here.

To compare relative values of lateral and dorsoventral radiographs for the differential diagnosis of heart disease, both views are included for a case of pulmonic stenosis and patent ductus arteriosus. Radiographs

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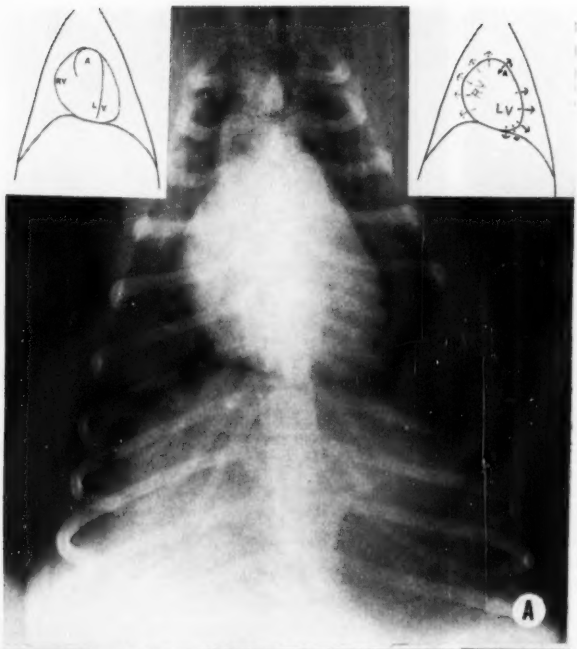
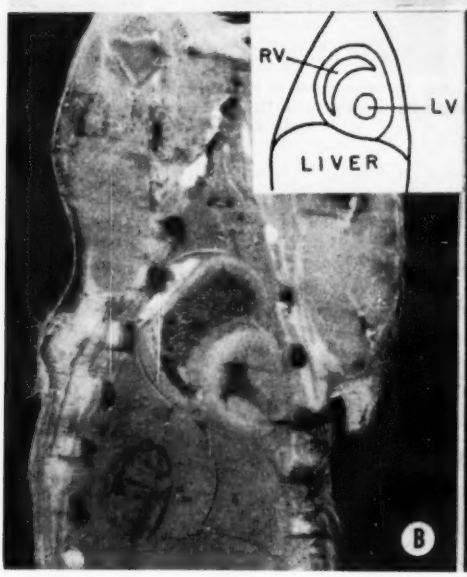
The author thanks Dr. C. Roger Smith for his assistance in preparation of this manuscript; and Drs. D. K. Detweiler and D. F. Patterson for reviewing the radiographs showing pulmonic stenosis.





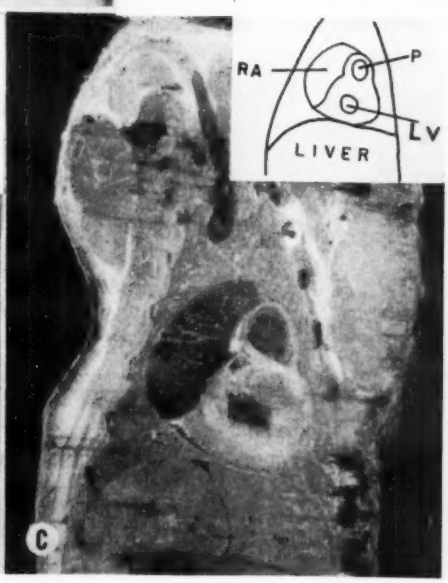


Fig. 1—(A) Dorsoventral radiograph of normal dog thorax and schematic diagram. Head appears at top, and left side of dog to the right of the figure. In upper left diagram, relative positions of right ventricle (RV), left ventricle (LV), and aorta (A) are seen; in upper right diagram, chambers and pulmonary artery, with arrows pointing in the direction pathologic enlargement would take. (B) Ventral cross section of normal dog thorax at point one third of the dorsoventral distance from the sternum; right ventricle (RV) and left ventricle (LV) are shown in schematic diagram in upper right. (C) Cross section 3 cm. dorsal to B; in schematic diagram in upper right, the right atrium (RA), left ventricle (LV), and pulmonary conus or pulmonary artery (PA) are marked.

of a Terrier, 3 years old, with congenital pulmonic stenosis are shown in (fig. 8A and B). From the dorsoventral view (fig. 8A), marked right ventricular enlargement and main pulmonary artery dilatation are visible. In the lateral view (fig. 8B), there is a cardiac shadow which is probably within normal limits for a heart in diastole. In this instance, the lateral radiograph is nondiagnostic of heart disease.

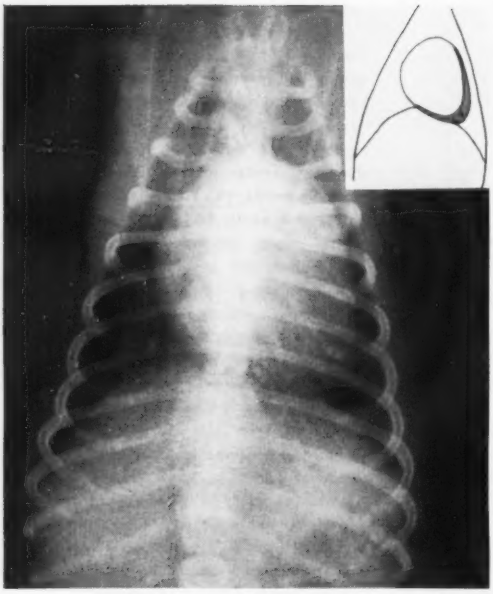


Fig. 2—Dorsoventral radiograph of dog, 8 years old, with mitral insufficiency. Notice the proximity of the left ventricular and pulmonary artery borders to the left rib cage. The heart has enlarged caudad and leftward, with slight bulging of the pulmonary artery cephalad and leftward.

Fig. 3—Dorsoventral radiograph of dog, 14 years old, with mitral insufficiency. The heart is enlarged to the left, but it is particularly prominent at the left-cephalic border. This bulging probably represents both pulmonary artery and left atrium.

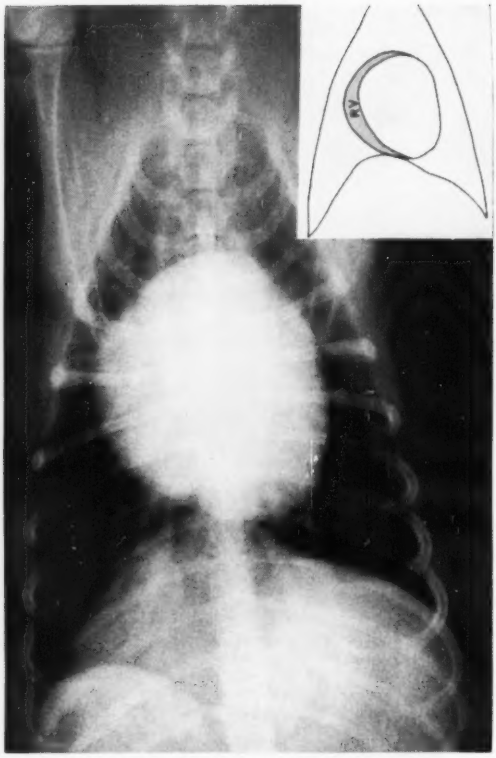


Fig. 4—Dorsoventral radiograph of dog with tricuspid insufficiency. The heart is prominent to the right and cephalad.

Two views of a Cocker Spaniel, 8 years old, with patent ductus arteriosus are shown (fig. 9A and B). In the dorsoventral radiograph (fig. 9A), left and right ventricular enlargement, and a slight prominence to the main pulmonary artery, can be seen. Combined with the characteristic systolic-diastolic "machinery murmur" auscultated with maximal intensity over the left third intercostal space, the diagnosis of patent ductus arteriosus with probable pulmonary hypertension can be made. On the other hand, in the lateral radiograph (fig. 9B) there is an enlarged cardiac shadow, with marked dorsal displacement of the trachea and pulmonary congestion. From this view, one may determine that the heart is greatly enlarged. One may not determine definitely which chamber, chambers, or vessels are enlarged (*see* discussion on cardiac displacement). From this radiograph alone, insight into the cause of the extreme cardiomegaly is

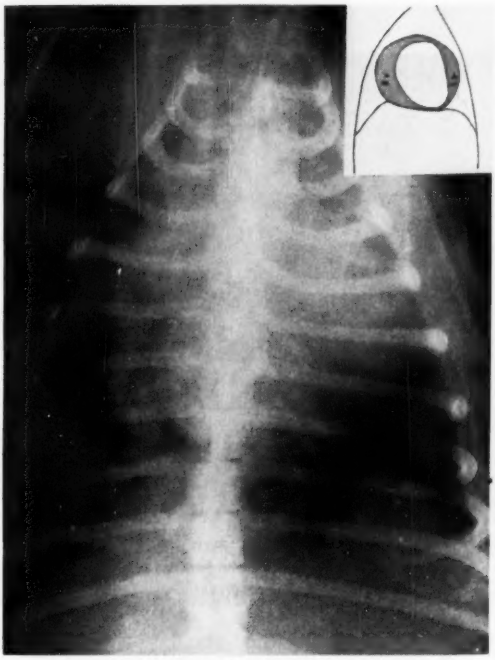


Fig. 5—Dorsoventral radiograph of dog, 17 years old, with both A-V valves insufficient and in congestive heart failure. Both ventricles are enlarged. The heart assumes almost circular shape.

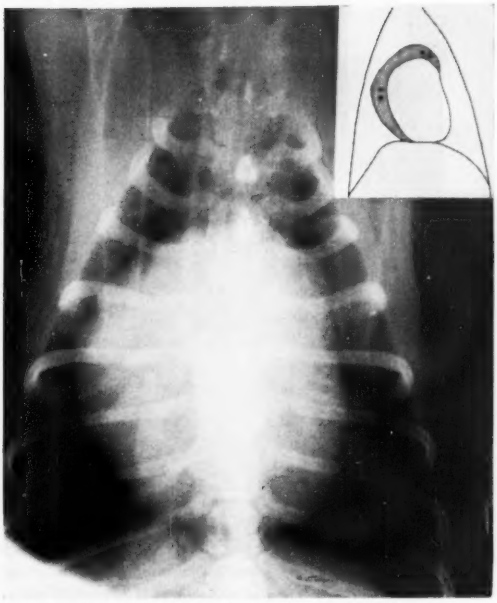


Fig. 6—Dorsoventral radiograph of Beagle, 5 months old, with pulmonic stenosis. Right ventricle is enlarged rightward and cephalad; pulmonary artery is enlarged leftward and cephalad. Notice the nearly 90-degree angle between the cephalic and left cardiac borders.

difficult. One may differentiate with less certainty whether both ventricles are enlarged, or whether a pendulous right ventricle is displacing the entire cardiac silhouette caudad and dorsad.

As discussed in a previous report,[5] the lateral radiograph is the only view on which one may define the left atrial border. In addition, pure right ventricular or left ventricular enlargement, in most instances, may be determined from this view. However, in borderline degrees of ventricular enlargement or with combined ventricular enlargement, I have found the dorsoventral radiograph superior to the lateral for visualizing, definitively, which chamber contributes the abnormal shadow.

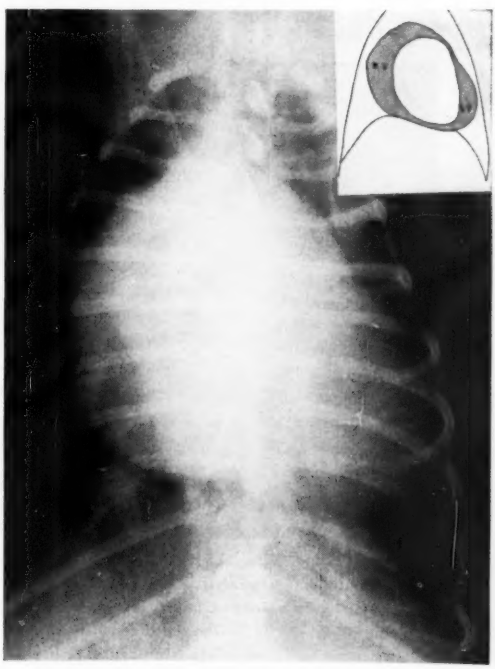


Fig. 7—Dorsoventral radiograph of Cocker Spaniel, 8 years old, with patent ductus arteriosus. The heart is enlarged markedly to the left and moderately to the right. The pulmonary artery enlargement gives the left-cephalic cardiac border a convex line. In left ventricular enlargement, without concomitant pulmonary artery dilatation, this border is usually concave or straight.

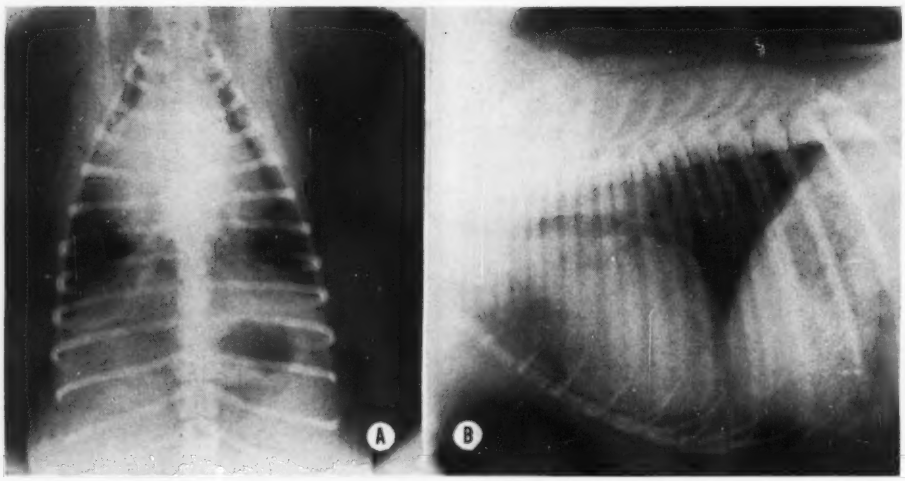


Fig. 8—Radiograph of Terrier, 2 years old, with pulmonic stenosis. (A) In dorsoventral view, marked right ventricular and pulmonary artery enlargement is seen. (B) In lateral view, cardiac silhouette is probably within normal limits for a heart in diastole.

Discussion

That chamber or vessel enlargement may be diagnosed radiographically has been the thesis of this report; however, it should be understood that one may not preferentially diagnose hypertrophy or dilatation—only enlargement—from the standard radiograph. Angiocardiographically, when a ventricular lumen is contrasted with radiopaque material, one may visualize the dimensions of the ventricular walls.[4,10]

Another word of caution must be ex-

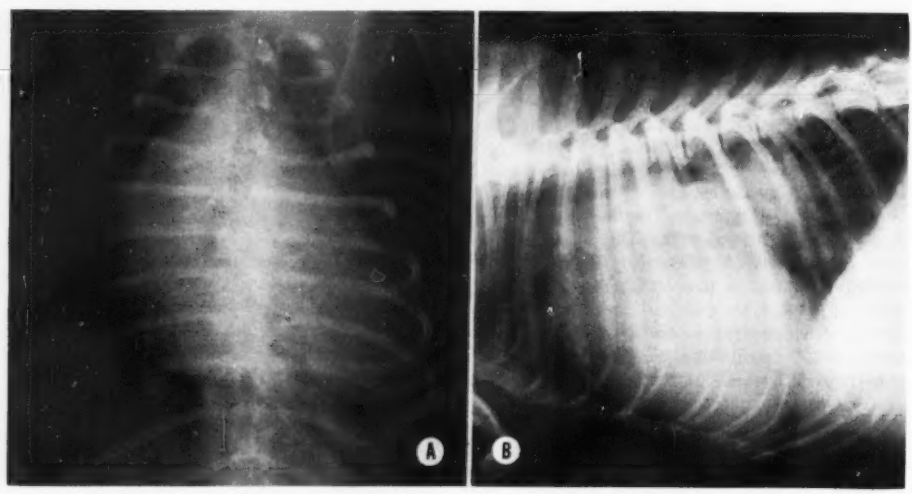


Fig. 9—Radiographs of a Cocker Spaniel, 8 years old, with patent ductus arteriosus. (A) Pendulous left ventricle and enlarged right ventricle are visible in dorsoventral view. (B) A generally enlarged heart, left atrial enlargement, pulmonary congestion, and marked dorsal deviation of the trachea are seen in lateral view. It is difficult to determine whether the left ventricle is enlarged or merely displaced by large right ventricle.

pressed pertinent to determining which of 2 enlarged chambers is causing the predominant displacement of the cardiac shadow. In some instances, particularly 3 (4:3). In the dorsoventral view, this same ratio (4:3) expresses the relationship between the longitudinal and lateral axes of the heart. Deviation of this ratio toward

TABLE 1—Comparison of Radiographic and Auscultatory Findings Associated with Heart Diseases in Dogs

Radiographic findings			Auscultatory findings			
Lesion	Left ventricle	Right ventricle	Pulmonary artery*	Murmur	Location of greatest intensity	Transmission**
Mitral insuf. (45% of AHD)	Enlarged	Normal: slightly enlarged in later stages	Normal to slightly enlarged	Systolic	Left & right 4th to 7th intercostal space (usually left)	Caudal and dorsal
Tricuspid insuf. (5% of AHD)	Normal	Enlarged	Normal to small	Systolic	Left & right 4th to 7th intercostal space (usually right)	Caudal and dorsal
Combined A-V insuf. (50% of CHD)	Enlarged	Enlarged	Normal to slightly enlarged	Systolic	Left & right 4th to 7th intercostal space (usually left)	Caudal and dorsal
Pulmonic stenosis (50% of CHD)	Normal	Markedly enlarged	Markedly enlarged	Systolic (thrill)	Left & right 2nd to 3rd intercostal space	Cephalic
Patient ductus arteriosus (35% of CHD)	Markedly enlarged	Normal, slightly enlarged in later stages	Normal to slightly enlarged	Systolic-diastolic (thrill)	Left & right 3rd intercostal space (usually left)	Cephalic; usually fairly well-localized

*Unless markedly dilated, the size of this vessel is difficult to assay radiographically without contrast material. **Transmission refers to the direction in which the murmur is conducted through the body from the point of maximal intensity. AHD—acquired heart disease. CHD—congenital heart disease.

with patent ductus arteriosus when the left ventricle is pendulously dilated, the heart will be displaced to the right, simulating right ventricular enlargement. The converse may be true with right ventricular hypertrophy resulting from pulmonic stenosis. In this instance, the large right ventricle displaces the cardiac silhouette to the left of the thorax, mimicking left ventricular enlargement. By studying the contours of the cardiac borders in normal animals and in animals with various lesions, one may soon become adept at determining, in most cases, whether the chamber in question is actually enlarged or merely displaced because of contralateral cardiac enlargement.

Because of the variety of body configurations which the veterinarian examines, radiographic standards by which the cardiac shadow may be evaluated are difficult to derive. I have attempted this in a preliminary report on 100 normal dogs,[6] but concluded that evaluation of absolute cardiac dimensions and cardiac-thoracic indexes as described in human literature would require a lifetime of statistical analyses of all breeds, ages, body configurations, and states of health and disease. One conclusion was that the ratio of the apicobasilar cardiac dimension to the cephaladcaudad (for the lateral view) was as 4 is to unity (increase in the cephalad-caudad axis, in the lateral radiograph, or the lateral axis in the dorsoventral radiograph), suggests enlargement of either or both ventricles.

Certain limitations to the interpretation of a single radiograph should be discussed. Position of the patient, particularly in the dorsoventral view, is extremely critical. Without precise superimposition of the sternum and vertebrae, a diagnosis of ventricular or pulmonary artery enlargement is difficult. For example, in a right dorsal oblique radiograph, the pulmonary artery will be predominant and the left ventricle will have greater proximity to the left border of the thoracic cage. In a left dorsal oblique radiograph, rightward displacement of the heart is simulated.

Caution must be used to discriminate between a radiograph taken with the heart in systole or in diastole. A diastolic heart will appear larger, the borders more rounded, and the pulmonary artery shadow less distinct. In systole, the cardiac shadow appears smaller and the borders sharper.

In the dorsoventral radiograph, the genesis of the left-caudal, caudal, right-caudal, right, right-cephalic, and cephalic borders of the cardiac shadow are well defined. The portion of the cardiac silhouette immediately caudad to the left-cephalic

border is less well understood, radiographically. Normally, this portion of the cardiac silhouette is contributed by the main pulmonary artery or the outflow tract of the right ventricle. In pulmonic stenosis with dilatation of the main pulmonary artery, this border becomes predominant. In other instances, where pathologic conditions are present, it is equivocal whether or not a large left atrium may not contribute to the left-cephalic border. Further study needs to be done on this subject.

Conclusion

With knowledge of which chambers or vessels may be enlarged in each of the various congenital and acquired cardiac lesions in dogs, one may determine the enlargement or normalcy of the left and right ventricles and the main pulmonary artery from a dorsoventral radiograph, and arrive at an accurate diagnosis by correlating this information with auscultatory and other clinical findings. Until more complete statistical analyses of radiographs are made, determinations of which cardiac border is dominant or abnormal will remain relatively subjective.

Summary

Left ventricular enlargement is characterized by caudad and leftward displacement of the cardiac silhouette in the dorsoventral radiograph. Displacement of the cardiac borders dorsad and rightward is observed in right ventricular enlargement. In dilatation of the main pulmonary artery, a left-cephalic bulge is observed in the cardiac shadow.

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Toxoplasmosis in Man and Dogs Related

The occurrence of toxoplasmosis in man, dogs, and cats was investigated in households in which toxoplasmosis had been diagnosed in either man, dogs, or cats. Incidence of recent toxoplasmosis was significantly higher in dogs selected on the basis of illness than in dogs selected at random. Similarly, the incidence of recent toxoplasmosis was higher in dogs from households with a human case of toxoplasmosis than in dogs selected at random, but the difference was not significant. The incidence of recent toxoplasmosis in human contacts of dogs with toxoplasmosis was significantly higher than in persons selected at random. An epidemiological relationship between toxoplasmosis in man and cats was less obvious. Recent toxoplasmosis was diagnosed mostly in dogs and cats with cerebral and gastrointestinal disturbances and illness of the eyes and the skeletal muscles.

Presence of recent toxoplasmosis was based on the presence of a relatively high titer in the Sabin-Feldman reaction accompanied by a positive complement-fixation test.—*Tijdschr. Diergeneesk., 85, (July 1, 1960): 788.*

Right Ventricular Aneurysm

in the Dog

Ivan E. DANHOF, PH.D.

DURING THE COURSE of experimental direct-vision intracardiac surgery in a series of dogs, a case of right ventricular aneurysm was encountered upon visualizing the heart by pericardiotomy through a right-sided thoracotomy. This case represents the only such aneurysmal anomaly observed in the present series of 278 dogs subjected to experimental intracardiac surgery, as well as the first such instance observed in the experience of the author which includes thoracotomy procedures in an additional similar number of dogs over a period of several years.

This case is considered unusual in that (1) cardiac aneurysm is relatively uncommon; (2) right ventricular aneurysm of the heart is exceedingly rare; (3) cardiac anomalies of the dog have been reported infrequently although this animal is widely used for surgical experimentation; (4) opportunity was afforded to observe the aneurysm directly during relatively normal cardiac function.

Material and Methods

A young, 12.5-kg., female dog of mixed breeding was anesthetized using pentobarbital sodium, 20 mg./kg., initially, supplemented by pentothal sodium by intravenous drip. A cuffed tube was placed endotracheally using succinyl choline chloride as an adjunct. Respirations were maintained by a mechanical respirator during the operative procedure. Following anesthetization, a right-sided thoracotomy was made in the fourth intercostal space, the pericardium incised, and the heart visualized. The right ventricular aneurysm was noted and observed *in situ*. Pulmonary artery pressure was obtained directly via an 18-gauge needle, and systemic arterial pressure was obtained through an indwelling polyethylene catheter in the femoral artery. At the conclusion of the experiment, the heart was examined for further cardiac anomalies, and the aneurysmal tissue excised and fixed in formalin. The tissue specimen was sectioned and stained with hematoxylin and eosin. *In situ* photographs did not have the degree of detail necessary for adequate reproduction, hence line drawings were sketched from the gross specimen.

Observations

Gross Anatomy.—The cardiac aneurysm was located apically on the right ventricle just lateral to the interventricular septum (fig. 1). The aneurysm appeared to be hemispherical with a diameter of 3.5 mm. and a maximum elevation of 2.2 mm. when fully expanded above the surface of the heart. It appeared to be thin-walled. No additional septal or valvular cardiac defects were observed.

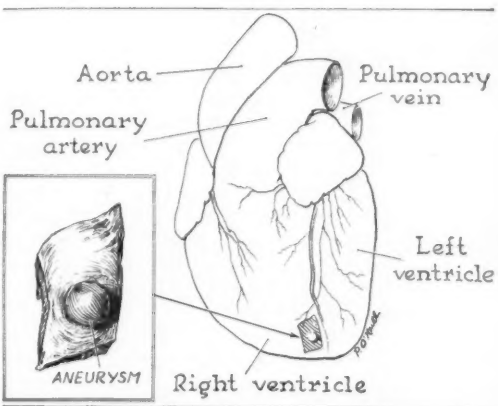

Fig. 1—A line drawing of the heart. The location of the aneurysm at the right ventricular apex is shown; the inset illustrates the appearance of the excised specimen.

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The author thanks Dr. Earnest Booth for his pathologic appraisal; Mrs. Sallie B. Cashon for preparation of the cardiac sections; and Miss Patricia O'Neill, staff medical artist, and Mr. Robert Sage, staff medical photographer, of the Department of Medical Art of the University of Texas Southwestern Medical School, Dallas, for their cooperation and assistance in securing the illustrations.

Fig. 2—A photomicrograph of a portion of the ventricular aneurysm and adjacent cardiac wall. The aneurysmal wall consists primarily of edematous connective tissue presenting in its outer area a myxomatous appearance. The adjacent ventricular myocardium appears normal. x 106.

Physiological Observations.—The aneurysmal sac had expansile changes during the cardiac cycle. During systole, it enlarged and presented momentarily, at the maximum ejection period, a fully rounded hemispherical bulb above the surface of the heart. During the latter part of isometric relaxation and first rapid filling phases of diastole, the aneurysmal sac appeared to be withdrawn from the surface of the heart into the right ventricle, the aneurymal sac presenting a small depression on the surface of the epicardium. This would suggest that the ventricular pressure during this phase was subatmospheric. During the slower ventricular filling phase of diastole, the sac was again expanded and presented a distended appearance intermediate in degree between the early diastolic phase and the maximum ejection phase of systole. The pulmonary arterial pressure during the cardiac cycle was determined to be 32/15 mm. Hg whereas femoral arterial pressure obtained simultaneously was 142/96 mm. Hg. The heart rate was estimated to be 124 beats per minute.

Microscopic Anatomy.—A small aneurysmal sac lined with endothelium was observed. The wall of the aneurysm was composed of edematous connective tissue in which the outer layers had a myxomatous appearance. The wall was devoid of cardiac muscle tissue. The cardiac muscle adjacent to the aneurysmal sac was normal in appearance (fig. 2 and 3), and the aneurysmal sac was free of thrombi.

Discussion

Incidence of Cardiac Aneurysm.—A perusal of the veterinary literature concerning ventricular aneurysm in the dog

Fig. 3—A photomicrograph of a portion of the ventricular aneurysm and adjacent cardiac wall illustrating the rather narrow ostium in the ventricular wall leading into the aneurysmal sac. The aneurysm is devoid of mural thrombi. x 101.

failed to reveal any published cases. Cardiac aneurysm was first described in the clinical literature in 1757.[9] Since that time several series of cases of cardiac aneurysm have been reported.[1-8,10-15] The occurrence of left ventricular aneurysm is considerably greater than right ventricular aneurysm, the latter having been reported as occurring only rarely.[12] Two instances of right ventricular aneurysm have been reported.[1,11] No further references to right ventricular aneurysm were found in the survey of clinical literature. One case[1] involved the right ventricular apex. Congenital aneurysms[11,14] apparently are quite rare.

Gross Anatomy.—It has been indicated[12] that the aneurysmal sac is almost always adherent to the pericardium. No such adhesion between the pericardium and the aneurysmal sac was observed in this case. This may be related to the relatively small size of the aneurysm. In an interesting series of experiments concerning exercise and experimental cardiac infarction, other investigators[13] found that exercise within 3 days after experimentally-induced infarction resulted in scar formation with aneurysmal bulging. If 6 days of rest were allowed following the infarction and prior to the exercise, a small, well-contracted scar without thinning of the ventricular wall resulted. A thorough examination of the heart in the present case failed to reveal anomalies other than the ventricular aneurysm. This case probably represents a congenital diverticulum of the right ventricle.

Physiologic Observations.—The collapse of the aneurysmal sac during certain phases of the cardiac cycle indicates that the right intraventricular pressure is decreased below the ambient barometric pressure. It should be remembered that the heart was observed with the thorax open. With the normally closed thorax, in which the intrapleural pressure usually remains negative with respect to the ambient pressure, such collapse movements of the aneurysmal sac probably did not occur. The pulmonary and systemic arterial blood pressures as well as the cardiac rate were within the expected range for the supine anesthetized dog.

Microscopic Anatomy.—The main element of the aneurysmal wall was found to consist of connective tissue. No cardiac muscle was present in the wall, and the sac was free of mural clots. The amuscularity of the aneurysmal wall has been reported[12] as the usual circumstance, but the sac usually contains a clot which often is laminated and may be organized as in an aortic aneurysm. No evidence of infarction was noted in the histologic study.

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Pups Get "Mumps"?

Swelling of the parotid glands was observed in 2 pups, aged 3 and 6 months. The swellings occurred in both pups at the same time mumps occurred in the households where they lived. Viruses isolated from the saliva of the pups possessed properties similar to those of mumps virus.—*Vet. Bull., 30, (July, 1960): 391; abstr. from J. Dis. Child., 98, (1959): 350.*

Experimental Evaluation of Culture and Serum Vaccination for the

Control of Swine Erysipelas

VI. Vaccination of Weanling Pigs Farrowed by Susceptible and Immune Dams

Richard D. SHUMAN, D.V.M.

IN A PREVIOUS report,[7] it was postulated that the immunizing potential of culture and serum vaccination was reduced in weanling pigs farrowed by erysipelas-immune dams. Subsequent observations have demonstrated that not only were the offspring of erysipelas-immune dams highly resistant to experimental exposure with virulent *Erysipelothrix rhusiopathiae* organisms before weaning, but also for a variable time after weaning.[11] Similar observations in African horse sickness have been made.[1] More recently, the principle of acquired immunity in the offspring of immune dams was demonstrated by other investigators.[4]

The objects of this experiment were: (1) to determine the response of weanling pigs to simultaneous vaccination with virulent *Ery. rhusiopathiae* culture and anti-swine erysipelas serum of equine origin, when farrowed by erysipelas-susceptible and immune dams, and (2) to examine the culture-serum dosage relationship.

Materials and Methods

Sows of mixed breeding (predominately Landrace) that had been bred to purebred Yorkshire boars were obtained from the nutrition herd of the Swine Research Branch, Animal Husbandry Research Division, Agricultural Research Center, Beltsville, Md. Nine were vaccinated with 1 ml. of reconstituted commercial desiccated virulent culture and 20 ml. of ARS standard lot 10 swine erysipelas hyperimmune serum within 4 days after breeding, and 8 were not vaccinated. After they had weaned their pigs, the sows were exposed to erysipelas infection by the percutaneous or skin scarification method.[5] After exposure, the surviving sows were held approximately 2 months in outside lots to see if joint abnormalities developed.

From the National Animal Disease Laboratory, Animal Disease and Parasite Research Division, Agricultural Research Service, USDA, Beltsville, Md.

Of the 9 litters farrowed by vaccinated dams, 7 litters were represented once and 1 was represented twice in each of 4 groups—A, B, C, and D. The small remaining litter, with the surplus from 2 other litters, was used as contact controls. All 9 litters were represented once in the litter control group. Of the 8 litters farrowed by nonvaccinated sows, 3 were represented once and 3 were represented twice in each of the 4 experimental groups—A^1, B^1, C^1, and D^1. The remaining 2 litters were small and, with the surplus from 3 other litters, were used as contact controls. All 8 litters were represented once, and 2 litters were represented twice in the litter control group.

Five or 6 pigs, including 1 contact control, were placed in a single pen. The litter control pigs, although in the same barn, were separated from the vaccinated pigs by empty pens. The pigs were confined to pens in the barn until the postvaccination observations were completed, after which they were allowed access to the outside runs. They were kept on concrete floors and runs until moved to outside hoglots. A balanced ration, containing an antibiotic,* was fed at the rate of 6 lb. per ton of feed. Tablets containing iron and copper were given *per os* shortly after birth and before weaning.

At the time of vaccination, the litters of the vaccinated dams ranged from 51 to 66 days of age, a mean of 63.5 days. The litters of the nonvaccinated dams, when vaccinated, ranged from 53 to 67 days of age, a mean of 60.5 days.

Vaccination of the weanlings was carried out with commercial desiccated virulent culture and ARS standard lot 10 swine erysipelas hyperimmune serum. The culture and serum were injected subcutaneously in the left and right axillary space, respectively. Vaccination of the groups of pigs was as follows: groups A and A^1 were given 0.5 ml. of culture and no serum (1:0); groups B and B^1, 0.5 ml. of culture and 2.5 ml. of serum (1:5); groups C and C^1, 0.5 ml. of culture and 5.0 ml. of serum (1:10); and groups D and D^1, 0.5 ml. of culture and 10.0 ml. of serum (1:20). Daily temperatures were recorded and observations of the site of culture vaccination were made for 12 days. Hemocultures were made on the third, fifth, and tenth days by withdrawing approximately 20 ml. of blood asepti-

*Aurofac, American Cyanamid Co., Pearl River, N.Y.

cally from the anterior vena cava and inoculating the entire amount in flasks containing 150 ml. of beef infusion broth. Subcultures of the broth were made after 48 hours' incubation at 37 C. and examined for the presence of *Ery. rhusiopathiae.*

Eighty-nine days after vaccination, all of the pigs were exposed to erysipelas infection by the percutaneous or skin scarification method. When the cutaneous reactions could no longer be seen, the pigs were moved to outside hoglots to see if joint abnormalities developed.

All groups of pigs were treated identically. Because they were not farrowed within the same time interval, however, the experimental procedures on groups A^1, B^1, C^1, and D^1 were initiated 21 days after those of groups A, B, C, and D. The pigs of groups A^1, B^1, C^1, and D^1 were also inadvertently held 21 days longer in the outside hoglots than those of groups A, B, C, and D.

Demonstration of either immunity or susceptibility was based on the response to the percutaneous or skin-scarification method of exposure. Four freeze-dried strains of *Ery. rhusiopathiae,* identified as S192, HC585, 422-1, and NF4, were used for exposure of pigs in the experiment.[7] The exposure strains were reconstituted in beef infusion broth and incubated for 24 hours at 37 C. prior to use. These cultures were always placed in the same sequence on a side of a pig. Daily observations were made after the exposure until the cutaneous reactions were not detectable. Temperatures were recorded daily until all pigs registered below 103 F. Classification of the results of scarification was as follows: (1) complete immune (I)—pigs showing no local reactions; (2) incomplete immune (II)—pigs with local reactions that did not persist or become extensive but could not be considered negative; (3) susceptible, localized (SL)—pigs with cuteaneous reactions on one or more scarification lines which persisted and became extensive but remained localized; and (4) susceptible, generalized (SG)—pigs that developed generalized infection. Generalization of infection was characterized by one or more individual cutaneous or urticarial lesions appearing on the side opposite to the one that was scarified.

Results

The 9 vaccinated sows were completely immune to swine erysipelas infection. The 8 nonvaccinated sows were susceptible; 1 had a localized reaction, and 7 had generalized infection. Two of the latter died after exposure on the eighth and tenth days, respectively. *Erysipelothrix rhusiopathiae* was recovered from the following sites: one or more joints, the subcutis of the skin scarification area and skin lesions not associated with the area of scarification, and the body organs of the sow that died on the eighth day. After 2 months in the outside lots, a visual examination of the vaccinated sows revealed no abnormalities of the leg joints. Of the nonvaccinated sows, 1 was lame. The lameness was apparently due to a swelling, which had the appearance of a corn, on the pad of one claw. The shoulder and elbow joints appeared normal when opened and were sterile.

In the weanling pigs of groups B, C, and D, no cutaneous reaction appeared at the site of culture vaccination. Of the 9 pigs in group A, 3 had a cutaneous or urticarial reaction which at the height measured from 2 by 2 to 2 by 4 inches. The postvaccination temperatures of the pigs were similar and, with the exception of 1 pig in each group, all were below 104 F. The temperatures of the contact controls for these groups were all below 104 F.

A cutaneous or urticarial reaction at the site of culture vaccination was found in 3 pigs in group A^1, 5 in group B^1, 3 in group C^1, and none in group D^1. These reactions varied in dimensions at their peaks from 1 by 1 to 4 by 5 inches. However, of the 9 pigs in group A^1, 7 also had generalization of the infection as manifested by the presence of cutaneous or urticarial lesions, too numerous to count, scattered over the body. One of these pigs died on the ninth day after vaccination. The postvaccination temperatures of groups B^1, C^1, and D^1 were below 104 F., with the exception of 3 pigs in group B^1 and 2 in groups C^1 and D^1. Seven of 9 pigs of group A had temperatures over 106 F. With 1 exception, the temperatures of contact controls for these groups were all below 104 F.

Hemocultures of 6 pigs in group A^1 and 2 in group C^1 yielded pure cultures of *Ery. rhusiopathiae.* The 6 pigs of group A^1 had generalized infection from which 1 died, while the 2 pigs of group C^1 had neither a visible reaction at the vaccination site nor a systemic response following vaccination.

The results of the percutaneous exposure of groups A, B, C, and D at 89 days after vaccination were:

Group A (0.5 ml. of culture and no serum): 5 pigs were completely immune and 4 were susceptible, with localized reactions.

Group B (0.5 of culture and 2.5 ml. of serum): 1 pig was completely immune and 8 were susceptible. Of the susceptible pigs, 7 had localized reactions and 1 had generalized infection.

Group C (0.5 ml. of culture and 5 ml. of serum): all of the pigs were susceptible. Eight had localized reactions and 1 had generalized infection.

Group D (0.5 ml. of cuture and 10 ml. of serum):

1 pig was completely immune and 8 were susceptible. Of the susceptible pigs, 7 had localized reactions and 1 had generalized infection.

All 8 contact control pigs and 9 litter control pigs were susceptible. The cutaneous reactions of 5 pigs of the contact controls and 4 pigs of the litter controls remained localized. The remaining pigs in these groups had generalized infection (table 1, A).

The results of percutaneous exposure of groups A^1, B^1, C^1,and D^1 at 89 days after vaccination were:

Group A^1 (0.5 ml. of culture only): all 8 pigs were completely immune.

Group B^1 (0.5 ml. of culture and 2.5 ml. of serum): 3 pigs were completely immune and 6 were susceptible, with localized reactions.

Group C^1 (0.5 ml. of culture and 5.0 ml. of serum): the results were the same as in group B^1.

Group D^1 (0.5 ml. of culture and 10.0 ml. of serum): 1 pig was completely immune and 8 were susceptible. Of the susceptible pigs, 7 had localized reactions and 1 had generalized infection.

All 8 pigs of the contact controls and 10 pigs of the litter controls were susceptible. The cutaneous reactions of 2 pigs of the contact controls and 1 pig of the litter control remained localized. The remaining pigs in these groups had generalized infection (table 1).

No abnormalities of the leg joints appeared in the vaccinated pigs of groups A, B, C, and D on examination after 61 days in the outside lots. One pig of the contact controls and 1 pig of the litter controls each had an enlargement of 1 leg joint, although these 2 pigs were not lame. The enlargements were accompanied by tissue changes that are associated with chronic arthritis. Both joints, however, were found to be bacteriologically sterile.

On examination of the vaccinated pigs of groups A^1, B^1, C^1,and D^1, after 82 days in the outside lots, 2 pigs of group A^1 (culture and no serum)were found to have joint abnormalities. Although these 2 pigs were lame prior to percutaneous exposure to infection, they were not lame when slaughtered for necropsy. The affected joints were enlarged and had tissue changes that are associated with chronic arthritis, and *Ery. rhusiopathiae* was isolated in pure culture. One pig of the contact controls and 1 pig of the litter controls, although not obviously lame, had joint abnormalities that are associated with chronic arthritis. *Erysipelothrix rhusiopathiae* was isolated in pure culture from the affected joints of the litter control pig, but the single affected joint of the contact control pig was sterile.

Discussion

It was surprising that only 7 of 27 weanling pigs, comprising groups B^1, C^1, and D^1, were immune to percutaneous exposure approximately 3 months after vaccination. Previous experiments[6,7] had shown that it was possible to protect a larger number of weanling pigs by this method of vaccination. A review of these past experiments suggested a re-examination of the comparative potency of the "new" standard serum ARS lot 10, "old" standard BAI lot 7, and a commercial lot of serum comparable to BAI lot 7. A preliminary test in pigs, using the intradermal exposure method, disclosed that ARS lot 10 serum had visually and systematically a greater inhibitory

TABLE 1—Response of Weanling Pigs, Farrowed by Erysipelas-Immune and -Susceptible Dams, to Percutaneous Exposure 89 Days After Culture-Serum Vaccination

Group	Vaccination dosage (ml.)		Pigs	Cutaneous response* (No. of Pigs)			Temperature response						
	Culture	Serum	(No.)	I	SL	SG	Below 102 F.	102 F. or above	103 F. or above	104 F. or above	105 F. or above	106 F. or above	107 F. or above
WEANLINGS FARROWED BY IMMUNE DAMS													
A	0.5	...	9	5	4	0	0	9	7	4	3	1	0
B	0.5	2.5	9	1	7	1	0	9	9	9	6	3	0
C	0.5	5.0	9	0	8	1	0	9	9	7	5	3	1
D	0.5	10.0	9	1	7	1	0	9	9	7	5	1	0
Contact controls	...	...	8	0	5	3	0	8	8	8	5	4	1
Litter controls	...	...	9	0	4	5	0	9	9	9	7	6	2
WEANLINGS FARROWED BY SUSCEPTIBLE DAMS													
A^1	0.5	...	8	8	0	0	1	7	2	0	0	0	0
B^1	0.5	2.5	9	3	6	0	1	8	2	2	1	0	0
C^1	0.5	5.0	9	3	6	0	0	9	6	3	2	1	0
D^1	0.5	10.0	9	1	7	1	0	9	8	5	2	2	0
Contact controls	...	...	8	0	2	6	0	8	8	8	6	3	2
Litter controls	...	...	10	0	1	9	0	10	10	10	8	6	1

*I = completely immune; SL = susceptible, localized; SG = susceptible, generalized.

effect on the infectiveness of the exposure culture than did the commercial lot of serum. Subsequent comparative tests in mice, with the results subject to biometric review, demonstrated that ARS lot 10 had at least twice the potency of either BAI lot 7 or the commercial lot of serum. These findings indicated that an unrecognized error had been made in methodology in our earlier series of mouse tests when we arrived at the new standard ARS lot 10, because the results then showed that we had attained equal potency between ARS lot 10 and BAI lot 7.

The relationship between culture and serum in this method of prophylaxis has been discussed,[2,3,8,9] but to our knowledge there has never been demonstrated a desirable range of serum potency related to its efficacy in pigs. The results of this experiment indicated that the serum can be too potent and constitute too great an inhibitory effect on the immunizing potential of the culture vaccine.

In connection with serum potency, one apparent inconsistency arose. The sows in this experiment received virulent culture and standard serum ARS lot 10 at a dosage ratio of 1 ml. of culture and 20 ml. of serum. All were found to be completely immune from 196 to 210 days after vaccination. Yet, only a fraction of the weanling pigs, which were given culture and serum and farrowed by susceptible dams, responded in a similar manner 89 days after vaccination. This apparent inconsistency may have been due to either the difference in age or the difference in the proportion of serum dosage to body size.

Although 25 vaccinated pigs of groups B, C, and D were classified as susceptible (22 SL and 3 SG), they had some degree of resistance when compared with their 17 susceptible contact and litter controls (9 SL and 8 SG). The contact and litter controls also had a greater proportion of pigs that had higher temperature responses. In the same manner, 20 susceptible vaccinated pigs of groups B^1, C^1, and D^1 demonstrated even greater resistance (19 SL and 1 SG). This also was clearly reflected in the markedly higher temperature responses of contact and litter controls.

Significantly, of a total of 14 pigs that had cutaneous reactions at the site of culture injection, only 9 were later found to be immune. Conversely, of 57 that did not have cutaneous reactions at the site of culture injection, 13 were immune. At the same time, those that had generalization of the infection following vaccination (only 1 had a local reaction at the site of vaccination) were later found to be immune. Apparently, the presence or absence of a local reaction at the site of culture injection was no assurance that the weanlings would subsequently be immune.

The pig that died on the ninth day after vaccination in group A^1 illustrated one of the vagaries of swine erysipelas; although the organism was isolated from the blood on the fifth day after vaccination, the organism was recovered only from the subcutis of a light purplish red portion of the skin over the abdomen after death of the pig.

It is worthy of note that no contact control became infected in 16 pens of pigs that had been given virulent culture either alone or with serum. This absence of infection was shown by the fact that all contact controls were susceptible when exposed percutaneously. It is believed, however, that we were fortunate in 2 instances, because acute erysipelas appeared after vaccination of pigs in the 2 pens of group A^1.

Although exposures were not made on the same day, contact and litter controls derived from vaccinated immune dams appeared to be less susceptible 3 months after weaning than comparable pigs derived from nonvaccinated susceptible dams. This was demonstrated by the fact that 8 of 17 of the former had generalized infection, compared with 15 of 18 of the latter. The apparent difference in susceptibility indicated that the offspring of the immune dams had retained some residual passive immunity from the suckling period to approximately 5 months of age. This is in agreement with the experimental observations of Wellmann and Heuner.[10,11]

Summary

Weanling pigs, farrowed by dams immune and susceptible to swine erysipelas, were vaccinated with virulent *Erysipelothrix rhusiopathiae* culture vaccine and anti-swine erysipelas serum of equine origin.

Weanlings farrowed by immune dams had a less favorable immunizing response than weanlings farrowed by susceptible dams.

On weanlings from immune dams, the culture-serum dosage ratios of 1:5, 1:10, and 1:20 produced only slight differences in the immunizing effect.

On weanlings from susceptible dams, the culture-serum ratios of 1:5 and 1:10 produced immunizing effects that were similar to each other. These 2 ratios were superior to the ratio of 1:20.

The majority of the vaccinated pigs in the experimental groups were classified as susceptible. They were less susceptible, however, than the pigs of the contact and litter controls. This difference in susceptibility was particulary noticeable when contrasting the vaccinated pigs with control pigs from nonvaccinated susceptible dams.

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Udder Spraying with DDT and Toxaphene-Lindane for Prophylaxis of Mastitis in Cattle

In northwestern Germany, mastitis due to *Corynebacterium pyogenes* infection has frequently occurred in cattle since 1950. Therefore, it was decreed in 1953 that cattle on pasture be sprayed with contact insecticides. In 1954, 412 nonlactating cattle were sprayed. "Esso" and a toxaphene-lindane preparation were used. Not only the udder, but the entire body was sprayed. There were 112 cattle treated with "Esso," and 108 with toxaphene-lindane. Udders were treated with an infusion medicament. The spray was applied under high pressure opposite to the direction of hair growth. Of the sprayed cattle, 1 contracted mastitis due to *C. pyogenes* while on pasture. Of the nontreated control cattle, 18 contracted mastitis due to *C. pyogenes*. This indicates that C. *pyogenes* mastitis was transmitted almost exclusively through insects while cattle were on pasture. Other advantages of spraying are the better development of pasture cattle because they are less bothered by insects and because they are better protected against disease transmitted by insects.—*Vet. Diss., 1958; abstr. in Die Vet.-med., 13, (1960): 136.*

Experimental Evaluation of Culture and Serum Vaccination for the

Control of Swine Erysipelas

VII. Serum Potency with Relation to Immunization of Weanling Pigs

Richard D. SHUMAN, D.V.M.

IN A PREVIOUS experiment, weanling pigs vaccinated with culture and serum* and farrowed by susceptible dams had a better immunizing response than weanlings farrowed by immune dams, but they did not respond as well as weanlings in earlier experiments. A probable explanation for this was presented when it was found that the "new" standard serum ARS lot 10 was at least twice the potency of the "old" standard serum BAI lot 7.[7]

The subject of serum potency has been discussed by other investigators[1,3-5,8,9] but, to our knowledge, there has never been demonstrated a satisfactory range of serum potency related to its efficacy in pigs in connection with simultaneous vaccination.

The object of this experiment was to determine a satisfactory range of serum potency in connection with simultaneous vaccination of weanling pigs farrowed by dams susceptible to erysipelas infection.

Materials and Methods

The base serum in this experiment was ARS lot 10 standard serum. Preliminary replicated serum-protection tests were conducted in male white mice weighing approximately 18 Gm. By testing 8 different concentrations of ARS lot 10, a sequence of ascending median effective doses (ED-50) was obtained. These 8 concentrations were from undiluted serum through the ratio of 1:8 and were identified as lots A through H, respectively. Dilutions were made in 0.5 per cent phenolized isotonic sodium chloride solution. A minimum of 7 mice was used for each logarithmic dose (0.005-0.64 ml.). The serum and the exposure suspension were administered simultaneously and were injected subcutaneously on opposite sides of the abdomen. Comparative tests were made again between "old" standard BAI lot 7 and "new" standard ARS lot 10. The mouse data were analyzed on a live and dead basis after an observation period of 14 days, and the figures for the ED-50 were computed by probit analysis.[2]

The mouse-exposure suspension was prepared by reconstitution of a freeze-dried culture of *Erysipelothrix rhusiopathiae* (strain 7873) in 1.0 per cent peptone water. Beef infusion agar slants were seeded with this suspension and incubated at 37 C. for approximately 18 hours. The growth was washed off the slants with peptone water and adjusted to 80 per cent light transmittance (Bausch and Lomb Spectronic 20, 600 mμ). Tenfold dilutions of this suspension were made in chilled peptone water, and beef infusion agar plates were seeded for a bacterial count. The 10^{-4} suspension of the organisms was used in carrying out the exposure, and each mouse was given, subcutaneously, 0.1 ml. of the suspension. A titration of the exposure culture was made in mice for each test. The bacterial suspensions were kept in an ice water bath until the completion of the mouse inoculations.

A total of 80 pigs were used in this experiment. They were farrowed by 9 dams that were shown to be susceptible to the percutaneous or skin scarification method of exposure after weaning the pigs. All 9 litters were represented one or more times in each of the 4 groups of pigs that were given culture and serum, and were also represented once in the litter control group. Surplus pigs were distributed as contact controls. Five or 6 pigs, including 1 contact control, were placed in a single pen. The litter controls, although in the same barn, were separated from the nearest pigs by empty pens and outside runs. The pigs were not allowed in the outside runs until the postvaccination observations were completed, and were kept on concrete floors and runs until the end of the experiment. All were fed a balanced ration containing an antibiotic*

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*Anti-swine erysipelas serum.

*Aurofac, American Cyanamid, Co., Pearl River, N.Y.

at the rate of 6 lb. to a ton of feed. Iron-dextran,** 2 ml. intramuscularly, was administered to each pig at 3 to 5 days of age.

When vaccinated, the litters ranged from 44 to 62 days of age, a mean of 52.8 days. The 4 groups of weanlings were vaccinated with 0.5 ml. of commercial desiccated virulent culture, reconstituted as directed by the producer, and 10 ml. of the selected serum lots A, B, D, and G, respectively. The injections were made subcutaneously in the right and left axillary space, respectively. Temperatures of the pigs and observations of the sites of culture injection were recorded daily for 9 days, although in a few instances the observations were made through the eleventh day. Hemocultures were made on the third, fourth, and fifth days after vaccination by withdrawing approximately 20 ml. of blood aseptically from the anterior vena cava and inoculating the entire amount in flasks containing 150 ml. of beef infusion broth. Subcultures of the broth were made after 48 hours' incubation at 37 C. and examined for the presence of *Ery. rhusiopathiae.*

Eighty-nine days after vaccination, all of the pigs were exposed to swine erysipelas infection by the percutaneous or skin scarification method.[6,7] The experiment was ended when the cutaneous reactions were no longer visible.

TABLE 1—Mouse Bioassay, Combined Data

Serum lot	Dilution ratio	Total tests (No.)	Total mice (No.)	Standard error of ED-50 (logs)	ED-50 (ml.)	95% confidence interval mean ED-50 (ml.)	95% confidence interval among tests for ED-50 (ml.)
A	1:1	16	512	0.040	0.030	0.025-0.036	0.014-0.061
B	1:2	14	400	0.042	0.056	0.046-0.068	0.027-0.116
C	1:3	6	168	0.065	0.063	0.047-0.085	0.030-0.130
D	1:4	14	440	0.042	0.110	0.091-0.134	0.054-0.234
E	1:5	11	320	0.048	0.131	0.107-0.163	0.063-0.270
F	1:6	8	232	0.056	0.162	0.125-0.210	0.078-0.336
G	1:7	7	378	0.060	0.208	0.158-0.275	0.101-0.422
H	1:8	2	64	0.112	0.280	0.167-0.469	0.135-0.579
BAI lot	7 —	6	300	0.065	0.065	0.048-0.088	0.031-0.135

Lot A = ARS lot 10, ratio 1:1, not diluted; lot B, ratio 1:2, 1 part serum, 1 part diluent. Standard deviation in logs among tests = 0.158.

Results

An ED-50, based on combined data and expressed in milliliters of serum, was obtained from mice for each lot of serum (table 1).

Lots A, B, D, and G were selected for use in the pigs. Lot A (ARS lot 10) proved twice as potent as BAI lot 7.

The calculated viability count of the mouse exposure dosage at 0.1 ml. for each test ranged between 1,020 and 2,540 cells, a mean of 1,661. Based on combined data of 17 tests, the titration of the exposure culture (7873) gave an l.d.$_{50}$ of $10^{-6.70}$.

Pigs from each of 4 groups of 15 pigs were given 1 of the 4 selected lots of serum in addition to the culture vaccine. The pigs developed cutaneous lesions at the culture injection site as follows (table 2, A): lot A, 1 pig; lot B, 6 pigs; lot D, 14 pigs; and lot G, 15 pigs, with 1 pig having a temperature of 106 F.

Erysipelothrix rhusiopathiae was not isolated from hemocultures of either the pigs that were given lot A serum or the contact controls. The organism was isolated from 2 pigs given lot B serum, from 3 given lot D serum, and from 4 given lot G serum (table 2, A).

On percutaneous exposure 89 days after vaccination, each group of 15 pigs responded as follows (table 2, B):

Lot A—1 pig was completely immune, 1 was incompletely immune, and 13 were susceptible. Of the 13 susceptible pigs, 8 had a localized reaction and 5 had a generalized infection.

Lot B—6 pigs were completely immune, 2 were incompletely immune, and 7 were susceptible. Of the 7 susceptible pigs, 5 had a localized reaction and 2 had a generalized infection.

Lot D—11 pigs were completely immune, and 4 were susceptible with localized reactions.

Lot G—All pigs were completely immune.

The 11 pigs of the contact controls and the 9 pigs of the litter controls were susceptible. Of the controls, 1 pig had a localized reaction and the others had generalized infection. One of the contact controls died on the sixth day after exposure. *Erysipelothrix rhusiopathiae* was recovered from the body organs, 5 of 6 leg joints examined, and 2 areas of affected skin.

**Armidexan, Armour Veterinary Laboratories, Kankakee, Ill.

Discussion

In addition to the base serum lot A, serum lots B, D, and G were selected on the basis of a tentative bioassay that indicated more nearly a decrease in potency by one-half between each lot. However, in the final analysis, lots C, E, and H would probably have served just as well.

The ED-50's (in ml.) computed from the combined test data are only relative and cannot be considered as fixed values. Different values would be expected under other test conditions. Despite efforts to conduct our tests with uniformity, there was considerable variability in the results from test to test. This is well demonstrated in the 95 per cent confidence intervals among tests for ED-50. However, these confidence intervals are not as long for the mean ED-50's calculated from the combined test data (table 1).

The 4 lots of serum differed in their influence upon the infectivity of the culture vaccine, as judged by the appearance of a cutaneous reaction at the site of culture injection. As the serum potency decreased, beginning with lot A, there was a corresponding increase in the number of pigs having cutaneous reactions. There was also a corresponding increase in the number of pigs from which the organism was recovered following vaccination. However, with the exception of 1 pig that was given lot G serum and had a postvaccination temperature of 106 F. for one day only, no significant difference could be seen between the recorded temperatures of the vaccinated pigs and the contact controls. At the time the 4 serum lots were selected for use in the experiment, it was believed that lot A would have a marked inhibiting influence on the infectiveness of the culture vaccine, and that lot G would permit a majority of the pigs to have signs of the acute infection. Although lot A did have a marked inhibiting influence, lot G was still of sufficient potency to prevent manifestations of the acute disease. Further dilution of the base serum will be necessary in order to determine the level of minimal potency.

The results of the percutaneous exposure indicated that the influence of serum on the infectivity of the culture vaccine was in turn directly associated with the immu-

TABLE 2—Comparative Swine Protection Tests with Undiluted and Diluted Anti-Swine Erysipelas Serum

A. AFTER VACCINATION

Serum lot No.	Dilution ratio	Dosage: Culture (ml.)	Dosage: Serum (ml.)	Pigs (No.)	Cutaneous reaction at site of culture inoculation (No. of pigs)	Positive hemoculture (No. of pigs)	Temperature response: 102 F. or above	103 F. or above	104 F. or above	105 F. or above	106 F. or above	107 F. or above
A	undiluted	0.5	10.0	15	1	0	15	8	0	0	0	0
B	1:2	0.5	10.0	15	6	2	15	6	0	0	0	0
D	1:4	0.5	10.0	15	14	3	15	10	2	0	0	0
G	1:7	0.5	10.0	15	15	4	15	8	1	1	1	0
Contact controls	...	...	...	11	...	0	11	4	2	0	0	0

B. AFTER PERCUTANEOUS EXPOSURE

Serum lot No.	Dilution ratio	Dosage: Culture (ml.)	Dosage: Serum (ml.)	Pigs (No.)	*Cutaneous response (No. of pigs): I	II	SL	SG	Temperature response: 102 F. or above	103 F. or above	104 F. or above	105 F. or above	106 F. or above	107 F. or above
A	undiluted	0.5	10.0	15	1	1	8	5	15	14	13	11	7	0
B	1:2	0.5	10.0	15	6	2	5	2	15	12	6	5	2	0
D	1:4	0.5	10.0	15	11	0	4	0	15	11	4	2	0	0
G	1:7	0.5	10.0	15	15	0	0	0	15	4	0	0	0	0
Contact controls	....	....	.....	11	0	0	0	11	11	11	11	10	9	4
Litter controls	....	....	.....	9	0	0	1	8	9	9	9	8	7	4

*I = completely immune; II = incompletely immune; SL = susceptible, localized; SG = susceptible, generalized.

nizing potential of this method of prophylaxis. This was shown by the increasing number of completely immune pigs beginning with 1 pig in the group that was given lot A serum, 6 given lot B, 11 given lot D, and 15 given lot G. This trend was supported by a corresponding decrease in the temperature responses. Under the conditions of this experiment, the results indicated that the potency of ARS lot 10 is too high for use in the simultaneous vaccination of weanling pigs farrowed by susceptible dams. In addition, the results of this experiment suggested the desirability of 2 levels of serum potency: one for vaccination in conjunction with virulent culture, and the other for therapeusis and when passive immunity is desired.

Although the immunizing response of the group of pigs that were given lot A serum did not compare favorably with the other 3 groups of vaccinated pigs, they did have some degree of resistance to percutaneous infection, e.g., 5 of 15 developed generalized infection, compared with 19 of 20 of the combined contact and litter controls.

Summary

Four concentrations of ARS lot 10 standard anti-swine erysipelas serum were used with virulent *Erysipelothrix rhusiopathiae* culture in the simultaneous vaccination of weanling pigs farrowed by erysipelas-susceptible dams.

As the serum potency was reduced through dilution, there was a lessened inhibiting influence on the infectivity of the culture vaccine; moreover, there was a corresponding increase in the immune response.

The experimental results indicated an approximal maximal range of serum potency but did not indicate the minimal range.

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Vitamin A Requirements in Pigs

When pigs are changed to a ration that is lacking in vitamin A, they show no immediate clinical signs of deficiency. The reason is that the vitamin A stored in the liver is used only gradually. Young pigs which have never had the opportunity to build up reserves are affected quickly.

Requirements for vitamin A in pigs are (birth to 8 weeks) 4,500 I.U. per 100 lb. of liveweight or 1,500 I.U. per pound of feed; (weaning to market weight) 4,000 I.U. per 100 lb. of liveweight or 1,500 I.U. per pound of feed; and (suckling sows) 8,000 I.U. per 100 lb. of liveweight or 3,000 I.U. per pound of feed.

These amounts are amply supplied when pigs are grazing green pastures. Ideal management for pregnant sows is to rear them on young, good quality legumes which will supply all their food requirements.—*J. Agric. S. Australia, 63, (1960): 308.*

Effects of

A Synthetic Nitrate Concentrate

Administered Orally to Cattle

T. A. HYMAS, B.S., D.V.M.
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EFFECTS of nitrate-contaminated drinking water on livestock were determined to enable engineers to properly design waste-disposal facilities for a new chemical manufacturing installation located near cattle pastures. Results of investigations to evaluate toxicity of a synthetic high nitrate-containing water solution when given as a drench or added to drinking water of cattle are reported.

There are numerous reports in the literature of alleged poisoning of both livestock and man from the consumption of nitrates in various forms. In most cases, nitrate poisoning in adult man has been the result either of consuming foods inadvertently prepared with various nitrate or nitrite salts mistaken for sodium chloride, or of consuming meats and meat products prepared with nitrate or nitrite salts. There are numerous reports of infant methemoglobinemia occurring as a result of formulas prepared with water containing relatively high concentrations of nitrate nitrogen.

Much natural drinking water contains nitrates as a result of leaching from the soil. Although livestock, chiefly cattle, but occasionally sheep, hogs, and horses, are poisoned by nitrate salts *per se*, such as potassium or sodium nitrate, most nitrate poisoning cases reported in the literature are a result of feeding high nitrate-containing forage.

Many variables are not yet understood concerning nitrate toxicity in both man and livestock.

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The authors acknowledge the technical assistance of Dr. D. D. McCollister and F. Oyen of Biochemical Research Department, Dr E. N. Luce of East Analytical Laboratory, Dow Chemical Company; also, R. L. Hollingsworth, Thiokol Corp., Huntsville, Ala.

Procedure and Results

A concentrated, aqueous synthetic nitrate stock solution was prepared to provide a constant and uniform source of experimental material with which to work (table 1). The nitrate stock solution was essentially saturated, but would remain in solution when maintained at room temperature (65-75 F.). One large container of the stock solution was prepared and used in all of these studies. Measured quantities of the stock solution were added to drinking water in experiment 2, whereas the stock solution was given by intubation in experiment 1.

The first experiment was conducted to determine toxicity of nitrates when given in single oral doses by intubation directly into the rumen; the second, to determine the palatability and possible toxicity of

TABLE 1—Stock Solution of Concentrated Nitrate Salts Mixture

Nitrate salts		Percentage by wt. of salts	Gm./10 liters of stock sol.
Calcium nitrate	$Ca(NO_3)_2$	4.21	90.3
Ferric nitrate	$Fe(NO_3)_3$	0.15	3.2
Ammonium nitrate	NH_4NO_3	18.43	395.1
Sodium nitrate	$NaNO_3$	14.00	300.3
Magnesium nitrate	$Mg(NO_3)_2$	43.11	924.7
Sodium iodide	NaI	0.58	12.5
Sodium hypo iodite	NaOI	0.63	17.5
Aluminum nitrate	$Al(NO_3)_3$	17.87	383.1
Sodium nitrite	$NaNO_2$	0.73	15.4
Ammonium sulfate	$(NH_4)_2SO_4$	0.04	0.9
Calcium chloride	$CaCl_2$	0.25	5.4
		100.00	2,148.4

When the above concentrate was assayed, the total nitrate nitrogen was found to be 17.52 per cent.

TABLE 2—Summary of Acute Oral Intubation Experiment

Calf No.	Interval between previous treatments (days)	Wt. at time of treatment (lb.)	Nitrate conc.* administered (ml.)	Total nitrate given (Gm.)	Nitrate given (mg./kg.)	Gross symptoms
1	----	490	1,180	206.5	928	Death 14 hr. post-treatment
2	----	510	590	103.25	445	None
2	16	534	885	154.87	640	None
2	13	540	1,032	180.6	737	Death 11 hr. post-treatment

*Concentrate contained 17.52 per cent NO_3.

drinking water containing various concentrations of nitrate solution when offered to cattle.

Experiment 1.—A yearling Guernsey steer (No. 1), weighing 490 lb., was used for the first oral intubation trial. He was kept with calf 2 in a small, 1-acre grass pasture. In addition to grass pasture, both received a small quantity of alfalfa hay daily. Water was available *ad libitum*.

Calf 1 was given 1,180 ml. of nitrate concentrate by stomach tube directly into the rumen (table 1).

On chemical analysis, the nitrate concentrate was found to be 17.52 per cent nitrate nitrogen. Thus, the calf was given a total of 206.5 Gm. of nitrate nitrogen, equivalent to 928 mg./kg. of body weight.

The steer gradually became lethargic, cyanotic, weak and, finally, prostrate. He died approximately 14 hours after he was given the concentrate.

At necropsy, gross pathologic changes typical of nitrate poisoning, were seen. The blood was dark, and clotting time was prolonged. Over the entire length of the gastrointestinal tract, were mild to moderate areas of irritation, and colon contents were blood-tinged. "Paint brush" hemorrhages were evident on the myocardium. Other tissues appeared normal upon gross observation.

Calf 2, a Guernsey bull weighing 510 lb., was confined in the same pasture and given the same feed, water, and care. He was given 590 ml. of nitrate concentrate which contained 103.25 Gm. of nitrate nitrogen, equivalent to 445 mg./kg. of body weight. This was one half the dose given calf 1. The concentrate was diluted in 2 quarts of water to simplify administration and was given with a stomach tube directly into the rumen. The calf was observed for several days, during which no outward signs of intoxication were seen. He continued to gain weight normally.

Sixteen days after administration of the initial dose, the calf was given a second dose of the same nitrate concentrate by the same technique. This dose, 885 ml. of the nitrate concentrate, contained 154.87 Gm. of nitrate nitrogen and was equivalent to 640 mg./kg. of body weight.

Again, no outward signs of intoxication were seen following dosing, and the calf continued to gain weight.

Thirteen days following the second dose, calf 2 was given a third dose (1,032 ml.) of the nitrate concentrate containing 180.6 Gm. of nitrate nitrogen and equivalent to 737 mg./kg. of body weight.

The nitrate solution was administered with a stomach tube as previously described. The calf was obviously affected in approximately 6 hours. By 8 hours after administration, he was recumbent and lethargic; cyanosis was marked, respiration was slowed, and blood pressure was

TABLE 3—Nitrate Concentrate Solution Added to the Drinking Water of Cattle

Phase* of exper.	No. days for each phase of exper.	Av. water consumption per animal per day (gal.)		Av. p.p.m. nitrate in water		Av. nitrate consumption per animal per day (Gm.)		Total wt. difference (lb.) per pair over test period	
		Nitrate	Control	Nitrate	Control	Nitrate	Control	Nitrate	Control
1	15	7.76	8.26	523	10	15.36	0.31	−65	−100
2	28	7.30	7.70	2,092	10	57.82	0.29	+160	+135
3	90	6.30	7.35	4,184	10	99.79	0.28	+70	+65
4	4	0.37	7.50	8,368	10	11.87	0.28	Not measured	

*During phase 1, cattle were fed pasture grass only; during phases 2, 3, and 4 pasture grass and hay were fed.

depressed. The calf died approximately 11 hours after he was given the third dose of the nitrate solution.

At necropsy, there was blood-tinged pericardial fluid, with severe ecchymotic hemorrhages on the myocardium and, to a lesser degree, on the endocardium. The entire gastrointestinal tract from the rumen through the colon was inflamed; the degree of inflamation varied from moderate in the large intestines and colon to severe in the omasum, abomasum, and duodenum. Grossly, other organs appeared normal (table 2).

Experiment 2.—Three "open" heifers and 1 steer, approximately 1 year old and of mixed dairy breeding, were allotted to 2 groups of 2 each. They were identified as follows:

Animal (No.)	Sex	Weight (lb.)
3	Male	510
4	Female	630
5	Female	610
6	Female	575

During the time the cattle were given the nitrates in drinking water, all were weighed biweekly. They were kept in pairs, and the 2 pairs were rotated weekly in 2 equal-sized, comparable grass pastures. They were given supplemental hay in phases 2, 3, and 4 of the experiment. The only water source in the pastures was large half barrels into which all water was measured and supplied *ad libitum*. No attempt was made to control normal evaporation from the barrels.

Phase 1.—In the first phase of experiment 2, cattle 5 and 6 were kept in a small grass pasture and were offered only nitrate-treated water, whereas cattle 3 and 4 were kept in another small grass pasture and were offered plain city water. Environmental conditions for all cattle were essentially alike.

A sufficient quantity of the nitrate concentrate stock solution was added daily to the drinking water of cattle 5 and 6 to provide approximately 523 p.p.m. total nitrate. During the first 15 days, no obvious gross differences were seen between cattle given the high nitrate-containing water and those given city water. Cattle given nitrate water consumed 7.76 gal. per head per day equivalent to 15.36 Gm. of nitrate per head per day, a slightly lower water consumption than the pair receiving plain city water, which drank 8.26 gal. per head per day. All 4 lost weight throughout the experiment due to a shortage of pasture and no supplemental feed. Each pair spent an equal period of time on each pasture plot. The cattle receiving the nitrate water lost a total of only 65 lb., whereas those receiving plain city water lost a total of 100 lb. (table 3).

Phase 2.—In the second phase of the experiment, the level of nitrate nitrogen was increased to 2,092 p.p.m. in the drinking water of 1 pair of cattle; it was their only source of water for 28 days. The same cattle used in phase 1 were utilized in phase 2. In phase 2, cattle 3 and 4, the controls in phase 1, were offered the high nitrate-containing water, and cattle 5 and 6 served as the controls and were offered plain city water.

Feed during the experiment was grass pasture plus alfalfa hay, an equal quantity for each group each day.

At no time were there gross differences in response between the 2 pairs. Water consumption was 7.7 gal. per head per day for cattle on plain water compared with 7.3 gal. per head per day for those given the nitrate-treated water. Total nitrates consumed by treated cattle averaged 57.82 Gm. per head per day; these animals gained a total of 160 lb. over the test period, whereas those receiving plain water gained only 135 lb. (table 3).

Phase 3.—This phase of the experiment was 90 days and still higher concentrations of nitrate were used. The drinking water for cattle 5 and 6 contained an average of 4,184 p.p.m. of nitrate nitrogen. Cattle 3 and 4 were given plain water. The 2 pairs received equal quantities of alfalfa hay twice daily and were rotated for equal periods of time on each of the 2 pastures.

At no time during or following the 90-day experiment was there a gross behavior difference evident between the pairs.

The cattle given plain water drank 7.35 gal. of water per head per day, whereas those given the nitrate-treated water drank 6.30 gal. per head per day. Weight gains were essentially the same for both groups. Treated cattle gained 70 lb.; nontreated, 65 lb. Nitrate intake for the treated cattle averaged 99.79 Gm. per head per day (table 3).

At the termination of the third phase of the experiment, all 4 cattle that had received high nitrate-containing water at some time during the course of the experiment were killed and were examined grossly

and microscopically for possible pathologic changes. There were no alterations either grossly or microscopically that could be attributed to the nitrate intake.

Phase 4.—To determine approximately the highest concentrations of nitrate acceptable to cattle, 2 yearling Guernsey calves, weighing about 500 lb. each, were given a solution containing 8,368 p.p.m. nitrate nitrogen as their only source of water. This was double the concentration (4,184 p.p.m.) given cattle in phase 3. These calves together consumed less than 3 gal. of the nitrate-treated water during 96 hours. After this period, plain water was consumed by both in copious amounts.

Discussion

Throughout the experiment, cattle always preferred water without the nitrate added. When cattle were being moved from one pasture to another or from pasture areas to the scales, the ones offered only nitrate water would make determined efforts to drink plain water.

The reduced water intake in the treated groups in the first 3 phases of the experiment is probably a reflection of the unpalatability of the nitrate-containing water. Although the cattle preferred water with no nitrate added, they would consume the treated water at concentrations of 4,184 p.p.pm. or less. During 90 days of consumption of near normal quantities of water containing over 4,000 p.p.m. of total nitrate, the calves had no outwardly discernible indications of intoxication.

Summary

From the limited observations made using this specific synthetic nitrate concentrate, it is apparent that single oral doses of the nitrate concentrate caused death when quantities of nitrate sufficient to equal 737 mg./kg. of body weight or higher were given at one time. When the nitrate quantity was reduced to 640 mg./kg. body weight or less, there were no observable signs of intoxication.

A synthetic concentrated nitrate-waste (17.52% nitrate nitrogen) was given via stomach tube to 2 yearling Guernsey cattle in sufficient amounts to cause death. Doses of nitrate nitrogen, 928 and 737 mg./kg. of body weight, caused death, whereas doses of 640 and 445 mg./kg. resulted in no detectable effects.

When the nitrate concentrate was added to the drinking water in quantities equivalent to 523, 2,092, and 4,184 p.p.m. of nitrate nitrogen, cattle would still drink near normal quantities if no other water source were available. Continuous intake of water containing 4,184 p.p.m. for 90 days was without effect, as judged from gross and microscopic observations. When cattle were given only water containing 8,368 p.p.m. of nitrate nitrogen they refused to drink, except for minimal quantities.

Vibrio fetus of Little Significance in Man

Although the organism now called *Vibrio fetus* was first isolated more than 50 years ago from aborting cattle, only 17 cases of human infection have been reported.

The mode of infection and transmission of the disease in man is not known. A few patients have been slaughterhouse workers or farmers while others have had no known direct contact with animals. It has been postulated that the organism may inhabit the mouth and from there invade the blood. Two cases of subacute bacterial endocarditis due to *Vibrio fetus* infection support this view since they followed dental extraction.

Three human patients with *Vibrio fetus* infection were observed at the Johns Hopkins Hospital in recent years. Each patient had septicemia, and thrombophlebitis was a prominent clinical finding.—*New England J. Med., 262, (June 16, 1960): 1218.*

Persistent Diarrhea in Colts

Associated with Infection with Aspergillus fumigatus

R. L. LUNDVALL, D.V.M., M.S.
P. F. ROMBERG, B.S., PH.D.

PERSISTENT DIARRHEA in colts and young horses following oral administration of antibiotics and sulfonamides has been observed with increasing frequency for the past several years. In many cases, a careful examination of the animal and its case history will reveal that the original cause of the diarrhea was a heavy infection with internal parasites.

Various combinations of sulfonamides, antibiotics, protective agents, and astringents have been used in an attempt to control this condition. Clinical evidence seems to indicate that the use of bacteriostatics of sulfonamide and antibiotic derivation are not only ineffective, but are probably contraindicated. Bacteriostatic agents result in establishment of abnormal bacterial and fungal flora in the gastrointestinal tract, especially in the lower portion, and may lead to a septicemia with possible localization in various tissues. The following case histories and reports of cultures of the intestinal contents from 3 colts tend to confirm this conclusion.

Case Reports

Three American Saddle Horse colts, 10 months old, each weighing approximately 450 lb., were presented for treatment April 16, 1958. The history given at the time indicated that the horses had suffered from persistent diarrhea for more than 4 months. The feces had never been fully formed during this time, and usually were "loose;" periodically they were profuse, and watery. All 3 colts were foaled on a supposedly clean pasture, and had remained there since birth. When the colts began to eat solid food, they were fed a mixture of rolled oats, a commercial supplement,* and corn, plus the pasture mixture of timothy and clover. When diarrhea was first observed, several protective and astringent preparations were administered. When these did not control the diarrhea, a variety of oral antibiotic and sulfonamide preparations, both alone and in combination with protective agents and astringents, were administered over a period of several weeks with no improvement in condition. Several months after the diarrhea began, feces were examined for presence of parasites. When parasite ova were found, the colts were treated. The parasiticide was not determined, but it did not control the diarrhea. For the month prior to admittance to the clinics, the colts were given no medication, although the diarrhea persisted.

At the time of admittance, the colts were in fair condition, but not fat. They were alert, had good appetities, and had temperatures from 99.6 to 101 F. Their general appearance was normal except for the diarrhea and slightly pale mucous membranes. Numerous Strongylus spp. ova and *Parascarus equorum* ova were present in the feces of all 3.

Hemoglobin levels of the colts ranged from 6.49 to 7.04 Gm./100 ml. of whole blood. Hematocrit values varied between 24 and 27 per cent. The total red blood cell count and the total and differential white blood cell counts are shown (table 1).

The colts remained in the clinics until April 28, 1958. Up to this time, the feces were repeatedly cultured for pathologically significant bacteria, with no conclusive results.

From the Department of Veterinary Medicine and Surgery, Veterinary Medical Research Institute, College of Veterinary Medicine, Iowa State University, Ames, where Dr. Lundvall is professor of veterinary Medicine and Surgery, and Dr. Romberg is professor of botany and plant pathology.

Published as paper 203.

*Omaline, Ralston Purina Mills, St. Louis, Mo.

TABLE 1—Total Red Blood Cell Count, and Total and Differential White Blood Cell Counts of the 3 Colts

Colt No.	Total r.b.c.	Total w.b.c.	Nonsegmented neutrophils	Segmented neutrophils	Monocytes	Lymphocytes	Eosinophils
1	8,000,000	10,360	2,500	6,600	100	1,100	—
2	6,850,000	9,500	1,200	4,400	—	3,600	300
3	8,600,000	15,480	1,100	8,800	200	5,100	200

During this same period, fecal and nasal cultures were made for examination for pathogenic fungi. These were grown on Sabouraud's and potato agar at 28 C. Isolation from each of the cultures yielded only one pathogenic species, *Aspergillus fumigatus*. Although it is true that this species is frequently found as a common contaminant, it is also well known as a pathogen which may cause death in chickens.

Many of the pathologic features of avian aspergillosis have been found in mammals. Aspergillosis in the horses was first described in 1856, and it has since been described in cattle, sheep, and pigs.[2]

Diagnosis is usually made by postmortem examination; however, subclinical infection has been diagnosed during life. In 1928, while examining horses for glanders, aspergillosis was found in 16 per cent of those examined.[4]

The source of this fungus is usually moldy hay or other feed. When baled hay or straw has been left in the open, cultures are easily obtainable and, at times, all individuals being fed this material may contract asperigillosis.[3]

During the interval between obtaining the fecal samples and receiving the report of the bacteriologic examination, the colts were treated symptomatically in an attempt to control the diarrhea, correct the anemia, and reduce the parasite infection. Various astringents, protective preparations, and combinations of both were used without favorable results. Tannic acid, powdered opium, kaolin, bismuth subcarbonate, a preparation of camphorated opium-pectin-milk of bismuth and colloidal kaolin,* diphemanil methylsulfate,** and kaolin and pectin† were all used at various times with no effect upon the character of the feces. An arsenic trioxide-tartar emetic-foenugreek preparation‡ was administered orally for 10 days to reduce the number of internal parasites. Phenothiazine was not used because of the anemic condition of all colts. On April 29, 1958, another fecal examination for presence of parasite ova was made. At this time, no parasite ova were found in 1 colt, a few Strongylus spp. ova were found in 1, and a few Strongylus spp. and *Parascarus equorum* ova were found in the third. A standard suspension of phenothiazine (¾ oz.) was administered to all 3 colts on May 1, 1958.

Anemia has been described as a clinical sign of aspergillosis;[1] however, the same sign is commonly observed in diarrheas of long standing. Citrated whole blood (250 ml.) was injected subcutaneously into each colt April 23, 1958; 2 oz. of an oral solution of iron and ammonium citrate, manganese citrate, sodium molybdate, copper gluconate, and copper sulfate* was administered every other day to each colt. An injectable iron-polysaccharide complex** (5 cc.) was injected intramuscularly into each colt every third day, for a total of 6 doses. The hematinics had little effect. The hemoglobin levels did not rise significantly when the last examination was made on May 20, 1958. The levels at this date were 6.49, 8.25, and 7.95 Gm. of hemoglobin per 100 ml. of whole blood, respectively, for each of the 3 colts.

The report from the first bacteriologic examination was received May 13, 1958. No significant bacteria were thought to be present. Results of subsequent bacteriologic examinations were also inconclusive. Two nystatin† boluses, 100,000 units each, were administered daily to each colt for 4 days. Each was also given a high enema of liquified feces from apparently normal horses daily for 3 days. Liquified feces, 1 pint to each colt, was also administered once orally through a stomach tube. The colts were discharged from the clinics May

*Mul-Sed, Allied Laboratories, Inc., Indianapolis, Ind.
**Variton, Shering Corp., Rahway, N. J.
†Kaopectate, Upjohn Co., Kalamazoo, Mich.
‡Arseno-Metic, Allied Laboratories, Inc., Indianapolis, Ind.

*Ferro-Coppergan, Norden Laboratories, Lincoln, Neb.
**Ferrextran, Fort Dodge Laboratories, Inc., Fort Dodge, Iowa.
†Mycostatin, E. R. Squibb and Son Co., New Brunswick, N. J.

28, 1958. The owner was directed to administer 2 nystatin boluses (200,000 units) daily to each colt for 5 days. Correspondence with the owner indicated that the feces gradually became more firm over a period of several weeks.

Numerous cases have been observed during the past 2 years having essentially the same history of having been treated for a diarrhea of unknown origin with one or several sulfonamides or antibiotics. It has not been possible to culture pathogenic bacteria or fungi from all of these animals because repeated fecal cultures are necessary in many cases, and cultures of fungi from fecal samples require a long time to isolate, particularly pathogenic species. Treatment with various drugs has been relatively unsuccessful, but some benefit may have been obtained by attempting to re-establish a normal bacterial flora by high enemas and oral administration of liquified feces from normal animals.

References

[1]Ainsworth, G. C., and Austwick, T. K. C.: Fungal Diseases of Animals. Commonwealth Agric. Bureau, Farnham, Royal, Bucks, Eng. (1959): 2.

[2]Bournay, J.: Pneumonomycose aspergillain Chez une Vache. Rev. vét. méd., 20, (1902): 121-128.

[3]von Hellens, O: Pneumonomycosis aspergillina hos daggdjar. Maanedsskr. Dyrl. 14, (1895): 512-520.

[4]Tscherniak, W. S.: Zur Lehre von den Broncho— und Pneumonomykosen der Pferde. Arch. f. wissensch. prakt. Tierheilk. 57, (1928): 417-444.

Passive Immunization by Antibody in Milk

Injection of diphtheria toxoid through the teat canals into the right quarters of cows' udders or subcutaneously resulted in the appearance of specific antibodies in both milk and blood. The level of antitoxin in milk varied with the stage of lactation but, except in colostrum, was always considerably lower than the simultaneous level in the blood. A relatively high antitoxin level in colostrum decreased as the secretion changed to milk.

Cows that were given injections of *Salmonella pullorum* vaccine in the left udder quarters or subcutaneously had an increased agglutinin titer in both the blood and milk. The agglutinin titer was persistently higher in milk from treated quarters than from other quarters.

When acute unilateral mastitis was induced with intramammary *S. pullorum* vaccine in a cow that had been previously immunized with both Salmonella and diphtheria antigens, the permeability of the udder to antibodies seemed to be increased. Antibodies in the milk from the inflamed quarters increased abruptly. The rise was temporary for diphtheria antitoxin and persistent for Salmonella agglutinins. Milk from affected quarters had a higher titer than did milk from other quarters. Diphtheria antitoxin levels in the blood did not change, whereas the Salmonella titers rose gradually.

A consistently higher level of antibodies in blood and milk suggested that antibodies spill over from the blood into the milk rather than form in the udder to flow back into the blood stream. High levels of antitoxin in the colostrum seem unrelated to the existing blood titer and result from storage and concentration in the udder for some time before parturition.—*Mod. Med., 28, (July 1, 1960): 134.*

Editorial

AVMA Conventions— When and Where

The Constitution and Bylaws assign to the House of Delegates the responsibility for choosing the location of the annual meeting, but selection of the dates is a function of the Executive Board.

Many of our members may not realize that these locations and dates need to be determined well in advance and that attendance at these meetings is becoming so large (table 1) that relatively few cities can be considered. The 1961 meeting will be held August 20 to 24 in Detroit and the 1962 meeting August 12 to 16 in Miami Beach. New York and Chicago will follow in turn. The 1965 meeting, to be held in District V, probably will be held in southern California.

The Time

The Executive Board has, on many occasions, considered the problem of when to hold annual meetings. Board members realize that, in late summer, cities are uncomfortably hot, especially those in the South; that summertime conventions often compete with family vacation plans; and that summer months are generally the busiest for small animal practitioners (12 out of 46 questioned said they did not attend the Kansas City convention because of the month). But they also recognize that AVMA conventions are becoming family affairs (more than half of the member registrants are accompanied by families); that few families are free to travel in autumn, spring, or winter; that faculty members and students are more free to travel in the summer; that most large animal practitioners are least busy in the summer (of those questioned, only 1 of 27 said he did not attend the Kansas City convention because of the month); that competition for convention facilities is less keen in late summer; that wintertime travel to or from some areas would be difficult; that summer wardrobes are more convenient for travel; and that wintertime conventions in some areas would mean confinement indoors, with outdoor activities restricted to winter sports.

The Board will from time to time reconsider the matter of annual meeting dates, making whatever decisions appear to be in the best interest of the Association and its total membership. Table 1 illustrates that some variation does occur with respect to the month selected for the annual meeting. Just what influence the month has had on attendance is difficult to say, however.

TABLE 1—AVMA Annual Meetings; Years in Which Held and Total Attendance

City	Date	Attendance
Milwaukee	Aug., 1951	3,128
Atlantic City	June, 1952	2,613
Toronto	July, 1953	3,516
Seattle	Aug., 1954	2,396
Minneapolis	Aug., 1955	3,715
San Antonio	Oct., 1956	2,684
Cleveland	Aug., 1957	3,458
Philadelphia	Aug., 1958	3,614
Kansas City	Aug., 1959	4,191
Denver	Aug., 1960	5,009

The Location

How can members influence the location? By planning ahead so as to be prepared to issue an invitation as an organized local group. The Bylaws specify that for the purpose of determining where the annual meeting is to be held, the United States and Canada shall be divided into five con-

vention zones (fig. 1) and that the meeting will be held in a given zone every fifth year. Shown below are the dates of several coming meetings and the zones in which they will be held:

Year of Meeting	Zone	Year of Meeting	Zone
1966	2	1969	1
1967	3	1970	5
1968	4	1971	2

If the veterinarians in a local association would like to have the national meeting in their city, they should take these preliminary steps: write the AVMA Business Manager for the basic requirements for our meeting, obtain the express interest of the local convention bureau, and ascertain that the local convention and housing facilities would in fact accommodate our annual meeting. Then they should request their delegate to present the invitation to the House of Delegates. Since the House must choose the location not less than two years preceding the meeting, the invitation should be presented three or even four years in advance.—D.A.P.

Fig. 1—Apportionment of Areas for AVMA Conventions.

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from the Research Journal

Fat Absorption in the Dog

The fat absorption pattern in the normal dog has been characterized and described by using an I^{131}-labeled neutral fat in test meal. Within 2 hours after ingestion of the fat meal, intestinal digestion, absorption, and distribution to the blood is practically complete. There appears to be a difference in gastric emptying time between young and old dogs, with a delay noticed in younger animals.—[*S. M. Michaelson, M. Y. El-Tamami, R. A. E. Thomson, and J. W. Howland: Absorption of I^{131}-Labeled Fat in the Dog. Am. J. Vet. Res., 21, (May, 1960): 364-366.*]

Mycoplasma Immunization in Poultry

Observations were made on methods of inducing and evaluating immunity against Mycoplasma infection in chickens and turkeys.

Recovery from the disease confers measurable immunity in turkeys and chickens. A vaccine prepared by sonic disruption of Mycoplasma did not produce immunity in chickens. Similarly, an aluminum hydroxide-adsorbed, formalin-inactivated vaccine did not immunize turkeys. An attenuated culture, administered intramuscularly, immunized chickens for about 2 months; turkeys did not respond as well. Major technical difficulties were involved in preparing and maintaining the large numbers of viable organisms required for immunization.—[*H. E. Adler, D. McMartin, and M. Shifrine: Immunization Against Mycoplasma Infections of Poultry. Am. J. Vet. Res., 21, (May, 1960): 482-485.*]

New Books

Biological and Chemical Control of Plant and Animal Pests

This book, edited by L. P. Reitz, is composed of papers presented by 19 participants in the program of Section O on Agriculture at the Indianapolis meeting of the American Association for the Advancement of Science, Dec. 28-30, 1957. The papers are organized under three major headings: the Public's Stake in Pest Control, Recent Advances in Chemical Control, and Biological Control of Pests.

The volume should prove of interest to anyone having a desire for orientation in this broad field and a desire to appreciate the problems, progress, and value of pest control. As a whole, the volume makes comfortable reading for scientists.

The devotion of two-thirds of the total space to biological control methods indicates the interest being sustained in this approach. Biological control has received emphasis in recent years because of the problems with residues of chemicals in foods. After reading this section, one is thoroughly impressed with the possibilities for continued development of control through use of pest diseases, antagonists, control of nutrients, predators, and radiation.

The much briefer discussions of chemical control methods indicate the progress made in the last decade in development of materials of progressively lower mammalian toxicity, lower or nonexistent residues on or in foods, and higher pest specificity. These discussions also indicate that properly supported research will undoubtedly lead to the development of highly effective, completely safe chemicals for pest control.

The section concerning the value of pest control in terms of increased productivity of food, fiber, and timber and good health are well written and leave no doubts concerning the need for continuing control.—[*Biological and Chemical Control of Plant and Animal Pests. Edited by L. P. Reitz. Eleven illustrations; 285 pages. American Association for the Advancement of Science, 1515 Massachusetts Ave., N.W., Washington 5, D. C. April, 1960.* Price: regular $5.75; A.A.A.S. members $5.00.]—R. D. Radeleff.

Medical Helminthology

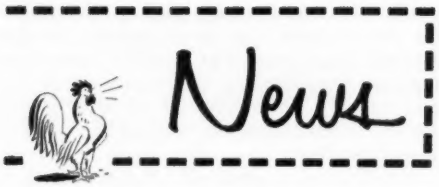
This textbook is a compilation of lecture notes on human helminthology, given by the author to students of medicine in the American University of Beirut.

Since it is compiled from lecture notes, the whole text follows a pattern used by most teachers of parasitology. The general introduction (Part I) comprises one fourth of the book and gives the historical foundation for the study of parasites. Part II is a systematic account of helminths parasitic in man, including intestinal nematodes, tissue nematodes, trematodes, cestodes, along with several small sections on Acanthocephala, Hirudinea, and Pentastomida. Each group of parasites includes a brief, but thorough discussion of synonyms, morphology, life cycle, epidemiology, pathogenesis, immunity, diagnosis, treatment, and preventive measures. The chapters are well illustrated with figures on morphologic characteristics of the various stages in the life cycle.

Part III is devoted to clinical and public health aspects of helminthic infections. This section includes the various clinical diagnostic techniques along with materials needed in parasitologic examinations.

In the appendixes is a valuable section on helminthic parasites of common laboratory animals along with a table of susceptible experimental definitive hosts of important helminth parasites of man. The 18 pages of material listed in the last appendix as recent advances could well have been incorporated in the main text to make it "up-to-date" and more useful to the student.

Very little in this book is of use to a veterinary practitioner or veterinary parasitologist. But it is a good handbook on human helminthology and could be of much value to those teaching medical parasitology or those interested in a concise discussion of human parasites.—[*Medical Helminthology. By J. M. Watson. 487 pages; illustrated. Bailliere, Tindall and Cox, 7 & 8 Henrietta St., London (Williams and Wilkins Company, Mount Royal Ave., Baltimore, exclusive U. S. agents). 1960. Price $15.50.*]—F. R. Koutz.



Convention Capsules

The sixty-three member legislative body of the AVMA, the House of Delegates, met for a day and a half during the AVMA Annual Meeting in Denver, Colo., to set the policies of organized veterinary medicine. The men, representing constituent associations of the United States and Canada, heard reports of Association officers and councils and took action on 26 resolutions. Here, in capsule form, is a recap of delegate deliberations in Denver.*

Reports of Officers.—President Scheidy, in addition to reporting on happenings during his term of office, urged the delegates to consider (*a*) defining duties of the vice-president, (*b*) providing continuing responsibilities for the past-president, (*c*) adopting a mail ballot for election of officers, and (*d*) reapportioning voting strength for delegates.

Executive Secretary and Treasurer Kingman reported on Association growth and the finances and general management of the headquarters offices. He reported receipt of $732,591.50 and expenditures of $678,995.17 for the fiscal year 1959-60, leaving a surplus of $33,596.33. He pointed out that Research Fund expenditures exceeded receipts by $12,241.83 during the year.

Since the Executive Board is charged with the responsibility for administration of the Association affairs, such activities as public relations, publications, professional relations, Washington office activities, scientific activities, membership matters, records, directory, and office management were reported to the delegates by Dr. D. J. Anderson, Executive Board chairman.

Council Reports.—The delegates (*a*) approved the revised Principles of Veterinary Medical Ethics presented by the Judicial Council (*b*) adopted a memorandum of understanding for humane organizations developed by the Council on Veterinary Service, (*c*) commended the Council on Research for the high caliber of veterinarians selected to receive AVMA research fellowships, (*d*) adopted the report of the Council on Public Health and Regulatory Veterinary Medicine calling for active support of programs for eradication of brucellosis in cattle and swine and eradication of hog cholera, and (*e*) commended the Council on Biological and Therapeutic Agents for its establishment of high criteria for advertising copy to appear in AVMA publications.

In addition, the House requested the Council on Veterinary Service to review the veterinary aspects of drug use in animal medicine with three other councils (Biological and Therapeutic Agents, Public Health and Regulatory Veterinary Medicine, and Research) and urged that the Council on Veterinary Service continue to study the problem of hip dysplasia in dogs.

Resolutions.—The House considered 26 resolutions. Those adopted by the House of Delegates (1) authorized a Centennial Planning Committee, (2) extended appreciation to local committees, radio, and television, (3) authorized the AVMA to participate in a national conference on animal transportation, (4) directed the Council on Veterinary Service to conduct a survey on the economics of veterinary practice, (5) urged continuing cooperation with the International Association of Milk and Food Sanitarians, (6) condemned continuing infringement by laymen upon the practice of veterinary medicine in Puerto Rico, (7) requested that the Council on Research study methods to expand research in animal diseases by state veterinary laboratories, (8) requested the Women's Auxiliary to the AVMA to serve as an official fund-raising organization for the Research Fund, (9) called for increased ca-

*The "Proceedings of the Business Sessions" will be mailed to members in December.

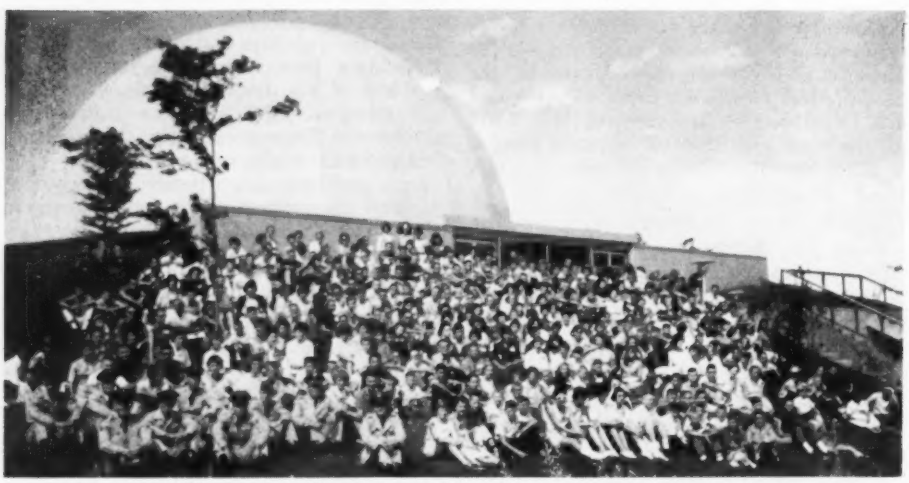
reer recruitment activities, (10) urged a change in the name of "equine encephalomyelitis," (11) requested a complete occupational study and survey of veterinary positions in USDA and other governmental agencies, (12) favored placing a suitable animal disease quarantine station on the Pacific Coast, (13) authorized AVMA participation in World Animal Health Year in 1963, (14) requested the establishment of a veterinary branch within the International Cooperation Administration, (15) asked that the Career Compensation Act be amended to provide increased constructive credit for veterinary officers, (16) urged the establishment of the grade "Brigadier General" for the assistant for veterinary services, USAF.

A number of resolutions were referred to committees for further study. These called for (1) the establishment of a scientific section devoted to regulatory veterinary medicine, (2) an amendment to the bylaws requiring a mail ballot to be used in the election of the president-elect and a change in delegates' voting strength, (3) the establishment of a school of specialized instruction for practitioners, (4) an amendment to the Bylaws requiring that AVMA members maintain membership in constituent associations, (5) an inquiry of the use of reserves accumulated by the AVMA Group Insurance Trust.

Action was postponed indefinitely on a proposal to grant voting rights based on the number of NAFV members to the delegate of the NAFV. A request that AVMA back legislation prohibiting the sale of harmful drugs was sent back to the constituent association submitting it, for clarification.

New Business.—The House of Delegates also considered a request to change the AVMA official emblem by substituting a more suitable design for the present caduceus. The motion to accomplish this was tabled. The House asked the Executive Board to reconsider its directive that hospitality suites be banned at AVMA meetings. The Executive Board was also requested to study the establishment of a group annuity or retirement program for AVMA members.

Veterinarians' Children Enjoyed the Convention Too



A visit to the USAF Academy Planetarium in Colorado was part of the program for teenagers who went to Denver with their parents the AVMA convention. The group of 400 saw a falcon flight demonstration put on for them by cadets, visited the USAF Physical Education Building and its two swimming pools, and was briefed on the constellations at the Planetarium. Members of the Academy Veterinary Services staff personally conducted the tour under the supervision of Col. Neil G. MacEachern, academy veterinarian.

97th AVMA Convention Allied Group Conference Reports

Association of American Boards of Examiners in Veterinary Medicine

The annual meeting of the Association of American Boards of Examiners in Veterinary Medicine was attended by 33 representatives of the association's 26 member states.

Problems common to examining boards were discussed. At the top of the list was the need of candidates to repeat National Board examinations when they move to a different state. It was felt that a reporting service enabling candidates to make their scores available to other states would help solve the problem. This and several other problems were referred to special committees for further study. Four regional committees were appointed to study the possibility of giving the National Boards on the same day in all of the regions.

All association officers were re-elected for the coming year. They are: Drs. E. R. Walker, Pawhuska, Okla., president; C. C. Rife, Atlanta, Ga., vice-president; and R. R. Shomer, Teaneck, N.J., secretary-treasurer.

s/ROBERT R. SHOMER, *secretary*

American Association of Equine Practitioners

More than 150 veterinarians attended the American Association of Equine Practitioners' mid-year meeting during the AVMA annual convention in Denver.

The looming threat of African horse sickness in this country, new research in equine diseases, recent developments in Thoroughbred, harness, and Quarter horse racing, and new medications were discussed. The next meeting of the equine practitioners will be Dec. 12-14, 1960, at the Westward Ho Hotel, Phoenix, Ariz. A full three-day program is planned.

American Association of Zoo Veterinarians

A proposed constitution was reviewed and accepted at the meeting of the American Association of Zoo Veterinarians in Denver, August 15. The three papers presented at the meeting were "Responsibilities of Zoo Veterinarians in the Post-Entry Quarantine of Imported Animals," by B. C. Swindle, D.V.M., USDA Animal Inspection and Quarantine Division, Quarantine Station, Clifton, N.J.; "Clinical Observations and Methods Used in Treatment of Young Chimpanzees," by William E. Britz, Jr., D.V.M., Holloman Air Force Base, N.M.; and "Study of Hematologic Values of Immature Chimpanzees," prepared by Jerry Fineg, D.V.M., presented by William E. Britz, Jr., D.V.M.

New officers are: Drs. Charles P. Gandal, New York, N.Y., president; Weaver M. Williamson, Brookfield, Ill., vice-president; and Werner P. Heuschele, San Diego, Calif., secretary-treasurer.

s/WERNER P. HEUSCHELE, *Secretary*

American Veterinary Radiology Society

The American Veterinary Radiology Society met August 15 in Denver. Attendance was over 100.

On the program were David M. Gould, M.D., professor and head, Department of Radiology, University of Colorado Medical Center, and veterinary radiologists U. V. Mostosky, D. F. Patterson, and Myron Thom.

Officers elected were Drs. Myron Bernstein, Glencoe, Ill., president; Newton Tennille, Stillwater, Okla., president-elect; W. H. Crago, Youngstown, Ohio, vice-president; and J. J. Fishler, Elkhart, Ind., secretary-treasurer.

s/DR. J. J. FISHLER, *Secretary*

Industrial Veterinarians Association

At the sixth annual meeting of the Industrial Veterinarians Association, Dr. R. W. Whitehead, University of Colorado, spoke on the "Theory and Etiology of Cancer."

New 1960-61 officers are: Drs. Don Rankin, New Brunswick, N.J., president; Ross Brown, Princeton, N.J., president-elect; Otto Siegmund, Rahway, N.J., treasurer; and C. W. Darby, St. Louis, Mo., secretary.

s/C. W. DARBY, *Secretary*

American Animal Hospital Association

The semiannual membership luncheon of the American Animal Hospital Association held in Denver during the AVMA convention was attended by 82 members.

They heard reports of the executive-secretary and the treasurer and a resume of the program for the next AAHA annual convention. One new feature of the convention slated for St. Louis, Mo., April 18-21, Sheraton Jefferson Hotel, will be an international, transatlantic conference with the British Small Animal Association meeting in London, England, which is to be held at the same time.

During coming months, the American Animal Hospital Association will hold 15 regional meetings throughout the United States and Canada.

American Society of Veterinary Physiologists and Pharmacologists

The two-day annual meeting of the American Society of Veterinary Physiologists and Pharmacologists in Denver was dedicated this year to Dr. H. H. Dukes in recognition of his many contributions to veterinary physiology and pharmacology.

Dr. Dukes addressed the group with a paper entitled "Veterinary Physiology: Past, Present and Future."

Sixty members attended the meeting at which 18 new members were elected into the Society.

New officers elected at the sessions are: Drs. C. F. Cairy, East Lansing, Mich., president; C. H. Clark, Auburn, Ala., president-elect; R. A. Gessert, Kalamazoo, Mich., secretary-treasurer.

s/D. H. WILL, *Secretary*

American Association of Veterinary Nutritionists

The meeting of the American Association of Veterinary Nutritionists in Denver was devoted to discussions of three major topics all concerned with the use of food additives.

One topic was a discussion of the food additive section of the Drug Encyclopedia and Therapeutic Index. It was agreed that the AAVN should encourage the continuation of the food additives section and, in fact, work toward its expansion.

The place of the veterinarian in the overall handling of food was another topic covered at the meeting. The group felt that the veterinarian in large animal practice should acquaint himself more thoroughly with the rules and regulations affecting his practice and the use of drugs. Further, he should acquaint his clients with the various problems involved in residues from the use of various drugs both in feed and through injection directly into the animal.

In a discussion on the diagnosis of toxicosis from excessive medication and incompatible combinations, the group stated that more emphasis should be given to the recognition of the toxicity of drugs being used in animal feeds. The group agreed that veterinarians should be able to recognize signs of poisoning, but on the other hand, not blame the drugs unnecessarily for vague signs that he observes in his practice.

Officers elected at the meeting were: Drs. Roy E. Nichols, Madison, Wis., president; Charles G. Durbin, Washington, D.C., president-elect; Spencer H. Morrison, Clinton, Iowa, secretary-treasurer.

s/CHARLES G. DURBIN, *President-Elect*

Association of Deans of American Colleges of Veterinary Medicine

Deans of 19 veterinary colleges and a representative of one met in Denver, Aug. 14, to discuss problems of veterinary education, veterinary colleges, and veterinary school faculties.

Current legislation affecting veterinary colleges was carefully reviewed by the group. The deans agreed that university presidents should be kept informed of the importance of land-grant legislation and should be given material outlining the anticipated use of requested funds. The group will continue to study the legislation and the subject will be discussed further at the November meeting of the Association of Deans of American Colleges of Veterinary Medicine.

Improvement of the state board examination system and preparation of students to take state boards were among other topics discussed at the meeting.

A proposal for utilizing the talents and abilities of retired veterinary faculty members was introduced to the deans. It called for a pooled fund set up by veterinary colleges to pay selected "retirees" to spend three months as specialist-advisors at each of the 20 veterinary colleges represented.

Suggestions for a world-wide program of high-level veterinary education and a plan to improve distribution of veterinarians throughout the world were part of a report

given by Dr. Glenn C. Holm, dean, College of Veterinary Medicine, Oklahoma State University, on the International Meeting on Veterinary Education which he attended in London last April.

Officers re-elected for the coming year are: Drs. E. E. Leasure, dean, School of Veterinary Medicine, Kansas State University, president; W. T. S. Thorp, dean, College of Veterinary Medicine, University of Minnesota, vice-president; and A. H. Groth, dean, School of Veterinary Medicine, University of Missouri, secretary-treasurer.

American Board of Veterinary Public Health

Twenty-five diplomates attended the annual meeting of the American Board of Veterinary Public Health, August 14 in Denver.

Guest speaker, Dr. Robert Downes, president of the American Board of Dental Public Health, spoke on the administration and operational problems of his board and related what he said to the American Board of Veterinary Public Health. Operational problems of the two organizations are similar. The dental board is working to establish programs of continuing education for their diplomates and to set up a field training period of one year for applicants.

Dr. Carl Brandly (KSU '23), who represented the board at the International Congress on Veterinary Education in London, reported on the meeting highlights. He also gave a brief review of the plans and organization of the Zoonosis Center established under the College of Veterinary Medicine at the University of Illinois.

s/C. H. SNIDER, *Secretary*

American Board of Laboratory Animal Medicine

At its recent meeting in Denver during the AVMA convention, the American Board of Laboratory Animal Medicine voted to change its bylaws to permit all veterinarians engaged in laboratory animal medicine, regardless of experience, to apply for associate membership in the Board.

Dr. Kent Davis (TEX '53), U.S. Food and Drug Administration, spoke to the group on the application of laboratory animal pathology to the study of drug toxicity. He expressed the concern of the FDA for the health of the test animals used in toxicity studies.

Dr. E. B. Scott, School of Medicine, University of South Dakota, gave a resume of his studies on amino acid deficiencies in the rat. His presentation included an illustrated description of both specific and nonspecific histopathologic changes associated with these deficiencies.

Mr. Bert Hill, Institute of Laboratory Animal Resources, National Academy of Sciences, described the activities of his Institute, giving special emphasis to those related to laboratory animal medicine.

The use of fluorescein-labelled antibodies in the diagnosis of laboratory animal disease was discussed by Col. Marvin B. Starnes, Walter Reed Army Institute of Research. He described the methods used, told of their current application, and suggested further uses for the diagnostic technique.

Also a part of the meeting was an informal "show and tell" session. Members showed lantern slides of unusual pathologic conditions and general discussions were held.

Women's Veterinary Medical Association

At their annual meeting in Denver, August 16, the Women's Veterinary Medical Association elected the following officers: Drs. Maxine Benjamin, Fort Collins, Colo., president; Jean Hagan, Oneonta, N.Y., eastern vice-president; Lois Hinson, Pekin, Ill., southern vice-president; Edith Williams, Toronto, Ont., central vice-president; Evelyn Keagy, Los Angeles, Calif., western vice-president; Marge Gulick, Great Barrington, Mass., secretary; and Lois Calhoun, East Lansing, Mich., treasurer. Dr. Jody Marshall, Golden, Colo., was appointed bulletin editor.

The Association presented a certificate and $100 to the highest ranking woman veterinary student, Beverly Holt, of Detroit, Mich.

American College of Veterinary Toxicologists

Three papers presented at the annual meeting of the American College of Veterinary Toxicologists in Denver were found particularly interesting by the group.

One was presented by Dr. Wayne Binns, USDA Agricultural Research Service, Plant Poisoning Division, Logan, Utah. Dr. Binns'

paper discussed the spread of halogeton, a poisonous plant, throughout the western states. It spread from a local condition in Utah only a few years ago until today it is one of the primary causes of plant poisonings in the western states, killing hundreds of animals annually.

Another paper, presented by Dr. Charles Durbin, Veterinary Division of the Food and Drug Administration, described the activities of the federal government in the field of toxicology and the operations of the Food and Drug Administration to control veterinary drugs.

Mr. Justus C. Ward, USDA Pesticide Regulation Branch, Agricultural Research Service, Washington, D.C., described the role of the pesticide and its effect toxicologically upon animals in his paper entitled "Toxicology and Federal Pesticide Control."

Officers elected at the meeting are: Drs. H. E. Furgeson, Anaconda, Mont., president; R. D. Radeleff, Kerrville, Texas, vice-president; and W. F. Harris, Puyallup, Wash., secretary-treasurer.

The next semiannual meeting of the ACVT will be in connection with the American Chemical Society's symposium on toxicology and pesticides in St. Louis, Mo., in March, 1961.

S/DR. H. E. FURGESON, *President*

Conference of Public Health Veterinarians

Activities of the past year were reviewed at the annual business session of the Conference of Public Health Veterinarians in Denver.

Conference activities included sponsorship of federal legislation to improve milk control regulations and surveillance over attempts to change the Poultry Products Inspection Act. New membership cards have been distributed within the last year.

A report of the membership committee revealed the need for a membership recruitment program as well as a collection of delinquent dues. Cooperation was requested from all members in recruiting new members from among the many hundreds of veterinarians now in public health work, related fields, and training.

A certificate of appreciation has been prepared for presentation to Dr. Holle at the annual meeting of the APHA in San Francisco this fall. Appreciation will also be expressed to Dr. Salisbury for his excellent work in preparing and supervising the Conference newsletter.

The program committee for the APHA annual meeting, under the chairmanship of Dr. Ben H. Dean, has arranged for two joint sessions with the epidemiology and laboratory sections as well as the Conference scientific and business meeting sessions. The program will offer an interesting variety in papers on zoonoses, food control, environmental health factors, and new techniques in the isolation of causative agents of disease.

National Association of Federal Veterinarians

The importance of membership in the National Association of Federal Veterinarians and in the AVMA was the subject of the keynote address given at the meeting of the National Association of Federal Veterinarians, August 15, in Denver. Dr. D. C. Van Houweling, assistant administrator, Agricultural Research Service, USDA, gave the address.

Other presentations at the meeting were on the responsibilities of a federal veterinarian, by Dr. M. R. Clarkson, administrator, Agricultural Research Service, USDA, and the actions of the AVMA House of Delegates, by Dr. F. L. Herchenroeder, secretary-treasurer of N.A.F.V.

Drs. Mark L. Morris and William W. Putney, the two candidates for AVMA president-elect, attended the meeting and spoke briefly to the group.

The 100 members attending the meeting were urged to begin thinking now of resolutions they might want to present at the annual meeting of the National Association of Federal Veterinarians in Charleston, W. Va., Oct. 19, 1960.

Army Veterinary Corps

The meeting of the Army Veterinary Corps officers in Denver, August 16, was such a success that plans are being made to hold annual meetings of the group during each AVMA convention.

Eighty Army veterinary officers on active duty, reserve officers, and retired Army veterinary officers attended the session.

Brief presentations were made by Col. William E. Jennings, Fifth U.S. Army veterinarian, Chicago, Ill., and Col. Nels F.

Christensen, newly appointed commandant of the U.S. Army Medical Service Meat and Dairy Hygiene School, Chicago, Ill.

Brigadier General Russell McNellis, Assistant for Veterinary Services, Office of The Surgeon General, Department of the Army, conducted the meeting and discussed latest developments in the Army Veterinary Corps.

National Veterinary Wholesalers Association, Inc.

A discussion of the purposes and plans of the Association was held by 23 members at the annual meeting of the National Veterinary Wholesalers Association, Inc., in Denver, August 14.

Officers elected at the Association's executive session on August 16 are: Mr. C. Guy Stephenson, president; Mr. Frank T. Alexander, vice-president; Mr. George McConnell, secretary; Mr. Jack Miller, treasurer.

s/C. GUY STEPHENSON, *President*

American Veterinary Exhibitors Association

Awards for outstanding exhibits were presented at the annual dinner meeting of the American Veterinary Exhibitors Association in Denver. The awards are presented each year for outstanding exhibits on behalf of all companies which supply medicinal products and instruments to veterinarians. This year's award winners were: Drs. R. A. Hendershott, Trenton, N.J., Owen E. Thomas, Granville, Ohio, Mrs. E. H. Braunworth, Glencoe, Minn., and Mrs. Frances Monlux, Ames, Iowa.

Association officers elected for 1961 are Mr. W. L. Martin, Eaton Laboratories, president; Mr. D. Peterson, Fort Dodge Laboratories, vice-president; and Mr. C. W. Rahner, Jr., Schering Corporation, secretary-treasurer. Mr. John Gwin, retiring president will serve on the AVEA advisory board. Mr. Jim Steward, Pitman-Moore, was elected to the Executive Committee.

The AVEA presented a $250 check to the AVMA Research Fund at the AVMA President's Reception, August 17. The Association serves as spokesman for companies exhibiting at national and state veterinary meetings. It therefore maintains a close liaison with the national and state veterinary medical associations.

Animal Disease Eradication Division

The Animal Disease Eradication Division of the Agricultural Research Service, USDA, sponsored a conference on tuberculosis for laboratory diagnosticians at the National Jewish Hospital, Denver, Colo., immediately preceeding the AVMA convention.

State, federal, and university laboratory personnel attended the conference. Speakers were authorities on tuberculosis in human and veterinary medical fields. Emphasis was placed upon the pathology and bacteriology of tuberculosis and analogous pathological processes.

The primary purpose of the meeting was to review laboratory techniques and procedures presently employed in the recovery and identification of the tuberculosis organism. It is expected that information developed as a result of this meeting and a similar meeting to be held in October in Charleston, W. Va., will be used as a basis for possible revision of present laboratory diagnostic techniques for the identification of tuberculosis. It is believed the exchange of information at these meetings will promote greater interest and uniformity of procedures as well as a better understanding of the need for additional investigational studies in tuberculosis diagnostics.

s/F. J. MULHERN, *Acting Director*

Meat Inspection Division, USDA

Inspectors in charge from meat inspection stations from eight western states met with other state and city meat hygiene officials during the AVMA convention in Denver.

The meeting was devoted to illustrated papers and discussions applying to the meat inspection field.

Dr. P. J. Brandly, chief staff officer for biological control, Washington, D.C., discussed "New Developments and Trends in Meat Inspection Bacteriology and Pathology." Drs. D. W. Glascock, inspector in charge, Omaha, Neb., and M. E. Hodgson, inspector in charge, Denver, Colo., reported on "Relationship of New Animal Husbandry Practices to Meat Inspection."

Other subjects discussed by the group were problems of handling and using food of sows that have produced specific pathogen-free pigs, methods of meeting meat inspec-

tion requirements, and the new humane slaughter law.

Dr. C. H. Pals reported on developments and practices at the newly established Meat Hygiene Training Center in Chicago. He pointed out that the school is one of the latest developments in the over-all Meat Inspection Division training program and said it should contribute largely to the improvement and unification of Federal meat inspection efforts.

Executive Board Committees to Meet

For the first time all committees of the AVMA Executive Board will meet when the Executive Board is not in session.

The four committees are scheduled to meet in Chicago, November 3 and 4, just prior to the Second Annual Conference of AVMA Constituent Secretaries, November 5 and 6.

The committees are: Ways and Means, Dr. Frank R. Booth, Elkhart, Ind., chairman; Prospectus, Dr. Mark Allam, Media, Pa., chairman; Centennial Planning, S. F. Scheidy, Bryn Mawr, Pa., chairman; and Constitution and Bylaws, J. A. Henderson, Guelph, Ont., chairman.

Should AVMA Relocate . . . Build?

A report presented in Denver by the Ways and Means Committe of the AVMA Executive Board, although tentative, seemed to favor maintaining the AVMA central office in Chicago at its present location.

The committee was established in 1959 to make a five-year study of the Association's housing needs and report annually on its findings. In its first report to the Executive Board, the committee noted that the AVMA is under contract to occupy the present facilities for approximately another four years.

Advantages of the Chicago location cited in the report were that Chicago is nearly in the center of the United States and has excellent transportation. Twenty national medical societies and 11 farm or livestock organizations have headquarters in Chicago.

The committee feels the present situation is not as unfavorable as many people believe. The lease rate per square foot at AVMA's central office compares favorably with similar space in other large cities. Also, due to the length of tenure at the present location, the lease rate is less than it would be in other Chicago locations.

The report also pointed out that it would probably be much more costly for the AVMA to maintain its own building than to rent space.

The committee will continue its study and report to the Executive Board again at the March, 1961, meeting of the Board.

AVMA Convention Attendance Bigger Than Ever

More people than ever before attended the AVMA convention this year. A total of 5,009 people registered at the Municipal Auditorium in Denver for the Ninety-Seventh annual AVMA Convention.

Official Registration Figures:

Veterinarians	2,335	46.6%
Women	1,215	24.3%
Exhibitor representatives	421	8.4%
Children	818	16.3%
Students	113	2.3%
Guests	107	2.1%
Total	5,009	100.0%

The five states with the highest number of registrants were: Colorado, 581; Illinois, 358; California, 348; Iowa, 319; and Texas, 263.

Geographic Distribution of Registrants at the Denver Meeting August 14-18, 1960

Alabama	55	Nevada	17
Alaska	4	New Hampshire	5
Arizona	63	New Jersey	83
Arkansas	22	New Mexico	50
California	348	New York	133
Colorado	581	North Carolina	16
Connecticut	25	North Dakota	37
Delaware	5	Ohio	160
District of Columbia	36	Oklahoma	92
Florida	34	Oregon	60
Georgia	48	Pennsylvania	117
Hawaii	3	Rhode Island	3
Idaho	48	South Carolina	3
Illinois	358	South Dakota	69
Indiana	140	Tennessee	19
Iowa	319	Texas	263
Kansas	240	Utah	67
Kentucky	50	Vermont	9
Louisiana	23	Virginia	35
Maine	10	Washington	69
Maryland	79	West Virginia	8
Massachusetts	25	Wisconsin	160
Michigan	203	Wyoming	49
Minnesota	159	U.S. Possessions	3
Mississippi	4	Canada	34
Missouri	216	Pan American	7
Montana	61	Foreign	51
Nebraska	231	Total	5,009

Allied Laboratories, Dow Chemical to Merge

Pitman-Moore Company's parent firm, Allied Laboratories, Inc., and Dow Chemical Company, one of the country's major chemical firms will merge. The proposal was approved August 30 by the directors of the two companies, but is still subject to ratification by Allied stockholders.

If the merger proposal is approved by the Allied stockholders at a meeting November 30, in Wilmington, Del., Allied would continue to operate under its present officers as a division of Dow. Both Dow and Allied officials emphasized that they plan no changes in personnel or in operating plans of Allied Laboratories, including Pitman-Moore.

Under the proposal, Dow common stock would be issued to Allied and Allied would distribute it to its stockholders on the basis of two thirds of a share for each share of Allied stock. Assets and business of Allied would be transferred to Dow. Dow would assume all Allied liabilities.

Kenneth F. Valentine, president of Pitman-Moore Company and executive vice-president of Allied feels that ". . . the proposed merger of our Company with Dow Chemical Company will benefit our shareholders, employees, and the general public alike. Through our organization, many new chemical compounds synthesized by Dow can now be marketed by our medical and veterinary sales staffs. In addition, our own research efforts can be expanded into new and additional areas. This cooperative research should bring many important new drugs to the medical professions in the years ahead."

Wool and Lamb Conference Meets

Can wool and lamb meet the competition of other products offered to the American public?

Domestic sheep industry leaders think they can but recognize that many problems will have to be smoothed out first. These problems and what can be done to solve them were the major topics discussed at the First National Wool and Lamb Industry Conference in Laramie, Wyo., August 8-9, 1960.

The conference was attended by 265 people representing all phases of the wool and lamb industry as well as related industries and organizations. It was split into two sessions—one on the production and marketing of wool and the other on the production and marketing of lamb.

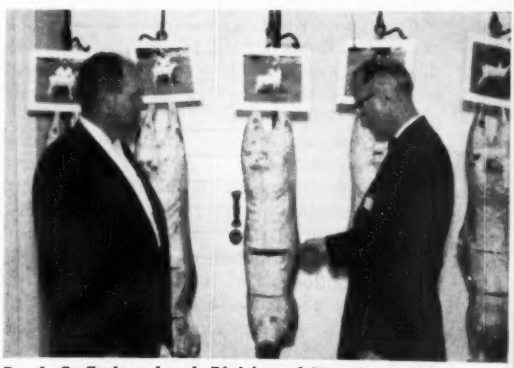
Here's a summary of the conference based upon the notes taken by AVMA's representatives at the meeting, Dr. E. C. Stone, AVMA Executive Board member and dean of the College of Veterinary Medicine at Washington State University, and Dr. D. A. Price, AVMA editor-in-chief.

Dr. Stone, who covered the lamb sessions, reports that marketing of lamb was one of the major problems discussed.

The basic lamb marketing problem is that lamb consumption is concentrated in certain areas of the United States and is, in many areas, seasonal. As a result, the slaughter of lamb is not constant and a uniform supply is not available. Lamb retailers are especially concerned about the uniformity of the product and the consistency of supply, because they're criticized if the supply diminishes after they've advertised lamb and increased demand for it.

Price control was also discussed at the lamb sessions. Many producers were concerned about the feed lot operation of packers. They felt that this type of operation sets the stage for price fluctuations that affect producers.

The entire industry is concerned about the possible price lowering that might result from importing lamb from New Zealand and Australia. New Zealand and Aus-



Dr. J. O. Tucker, head, Division of Veterinary Science, University of Wyoming, and Dr. D. A. Price, AVMA editor-in-chief, participate in sheep grading demonstrations at the First National Lamb and Wool Industry Conference.

tralia industries have been encouraging importation, saying that this will help the American industry solve the problem of inconsistent supply.

Problem-solving suggestions centered around developing a lamb carcass that the packers, retailers, and public will demand, and providing a constant and uniform supply of lamb for retail trade. It was felt that the educational program encouraging the public to buy lamb should continue, and that information about the nutritional value of lamb should be circulated to the general public. Information on the preparation of lamb dishes should also be prepared for housewives since proper cooking of lamb is important.

At the wool sessions, covered by Dr. D. A. Price, a manufacturing representative stated that a big shift to synthetic fibers has already taken place and warned that growers must supply a new product that has uniformity of grade and length and is free of defects such as straw, burrs, sisal, jute, and branding paint. He urged that attention be given to reducing cost of production, increasing tensile strength, and removing black hairs, all through better breeding. The manufacturer proposed that producers try to attract eastern capital for building facilities in which to store wool until it is needed for manufacturing. The listeners heard a representative of the woolen textile industry warn that several characteristics of wool—itchiness, yellowing with age, shrinkage, and susceptibility to alkali damage—should be given immediate attention if wool is to preserve its claim to superiority over other fibers.

Producers were warned not to overlook the cost of damage done to wool by parasites, diseases, and shipping and were urged to consider these factors in industry-wide planning.

One program speaker predicted that the size and number of range flocks will continue to decline because of the increasing public demand for recreational land. Because of this he felt that the future of the sheep industry lies in the development of more farm flocks.

Send Applications for NSF Graduate Fellowship Programs Now

Applications for two National Science Foundation graduate-level fellowship programs are now being accepted. They are the cooperative graduate fellowships for the academic year 1961-1962 and the summer fellowships for graduate teaching assistants for the summer of 1961. The deadline for cooperative graduate fellowships applications is Nov. 4, 1960, and for summer fellowships, Dec. 9, 1960.

There will be 161 institutions participating in the cooperative graduate fellowship program and all but 5 will also participate in the summer fellowships for graduate teaching assistants program. A list of institutions cooperating in the programs can be obtained by writing to the Public Information Officer, National Science Foundation, Washington 25, D.C.

Dr. W. W. Armistead Appointed National Consultant in Veterinary Medicine

Dr. W. W. Armistead (TEX '38), an AVMA past-president, has been appointed national consultant in veterinary medicine by Major General Oliver K. Niess, USAF Surgeon General.

As national consultant in veterinary medicine, Dr. Armistead will serve as advisor to Major General Niess on matters pertaining to the Air Force Veterinary Service.

Dr. Armistead received his M.Sc. degree from Ohio State University in 1950 and his doctor of Ph.D. degree from the University of Minnesota in 1955.

Dr. W. W. Armistead

He is dean of the College of Veterinary Medicine, Michigan State University. From 1953 to 1957 he was dean of the School of Veterinary Medicine at the A. & M. College of Texas and prior to this was professor of veterinary medicine and surgery at Texas A. & M.

Dr. Armistead is a past-president of the Texas Veterinary Medical Association and a member of the Michigan Veterinary Medical Association, the Texas Public Health Association, the New York Academy of Sciences, and the Conference of Public Health Veterinarians. He has also served as editor of the *North American Veterinarian* from 1950 to 1956.

Dr. K. E. Peterson Promoted by USDA

Dr. Keith E. Peterson (WSU '45), has been promoted to assistant inspector-in-charge at the Los Angeles, Calif., meat inspection station, USDA. Since 1958 he was assistant inspector-in-charge at Denver, Colo.

Dr. Keith E. Peterson

Dr. Peterson entered the meat inspection service at Seattle, Wash., in 1947, and remained there until he entered the Army Veterinary Corps in 1952. In 1954, his military service completed, he returned to the meat inspection service at Salt Lake City, Utah. He was made inspector-in-charge at the Green Bay, Wis., station, and after two years in that position, was transferred to the Denver station.

Dr. B. Parker Promoted

Dr. Bill Parker (TEX '51), has been promoted to the position of assistant inspector-in-charge, Boston, Mass., meat inspection station, USDA. He went to Boston from Houston, Texas, where he held a supervisory assignment since 1958.

Dr. Bill Parker

Since Dr. Parker entered the meat inspection service in 1953 at Fort Worth, Texas, he served as inspector-in-charge at Butte, Mont., and Lake Charles, La., in addition to his Houston assignment.

Dr. F. W. Crawford Retires

Dr. Frank W. Crawford (KSU '23), retired from the Meat Inspection Division, USDA, Aug. 31, 1960, after 34 years of service. He was inspector-in-charge of the Fort Worth, Texas, station since 1952.

Dr. Crawford entered the Meat Inspection Division at South St. Paul, Minn., as a junior veterinarian in 1926. From 1937 to 1946 he held supervisory positions at Sioux

Dr. Frank W. Crawford

Falls, S.D., Kansas City, Kan., and Austin, Minn. Dr. Crawford is a Colonel in the Veterinary Corps of the U.S. Army Reserve.

He has been succeeded by Dr. E. M. Christopherson.

Dr. E. M. Christopherson Promoted

Dr. E. M. Christopherson (TEX '40), has been named inspector-in-charge of the Fort Worth, Texas, Meat Inspection Division station by the USDA.

Dr. E. M. Christopherson

Immediately after his graduation from veterinary college, Dr. Christopherson entered government service and in 1941 was assigned to the Meat Inspection Division at South St. Paul, Minn. He had subsequent assignments at San Francisco and Los Angeles, Calif., and at Omaha, Neb., where he was assistant inspector-in-charge since 1941.

Among the States and Provinces

Delaware

NEW CASTLE COUNTY V.M.A. REVIEWS YEAR'S ACTIVITIES.—Matters before the New Castle V.M.A. during the past year were support of the new State Veterinary Practice Act, establishment of revised minimum fees, continuance of rabies clinics in the county, and a joint meeting with the Brandywine V.M.A.

Co-sponsorship with the city of Wilmington of a rabies inoculation program has been the major public relations activity of the association.

The New Castle County V.M.A. reports a total membership of 26; 80 per cent of the membership is active. A membership breakdown follows: large animal practice, 2; mixed practice, 4; teaching or industrial veterinarians, 2; small animal practitioners, 18. Dr. E. Jefferies Hathaway (UP '53) is president.

Meetings during the past year covered such topics as advances in orthopedics, the open heart operation, vascular surgery, insurance, advances in equine medicine, urology, and training dogs for police work.

Indiana

CENTRAL INDIANA V.M.A. TO CO-SPONSOR MEETING.—The Fifth Regional Conference on the Nitrofurans in Veterinary Medicine will be co-sponsored by the Central Indiana V.M.A. and Eaton Laboratories Division of

the Norwich Pharmacal Co., Indianapolis, Ind., Nov. 16, 1960. Veterinarians from Indiana, Illinois, Michigan, Ohio, and Kentucky are being invited to attend the all-day conference entitled "New Horizons in Chemotherapy."

Recently developed methods of treating diseases of farm animals and pets will be discussed at the meeting by clinical investigators from this country and Canada. During cooperative diagnosis sessions in the morning, clinical and pathologic data on puzzling large and small animal diseases will be presented by experts for discussion by the audience. Separate afternoon sessions will be devoted to reports of clinical investigation in large and small animal medicine. Diseases of beef cattle and bovine mastitis, enteric infections and eperythrozoonosis of swine, enteritis and respiratory tract infections in dogs, small animal surgery and the role of the small animal practitioner in treating horses will be discussed at the sessions.

Louisiana

LOUISIANA V.M.A. ELECTS NEW OFFICERS.—New officers elected at the Ninth Annual Convention of the Louisiana V.M.A. are: Drs. Robert K. Morris (TEX '48), Lake Charles, president; John Davis (TEX '53), Shreveport, vice-president; Robert Lank (KSU '42), Baton Rouge, secretary; W. J. Austin (AUB '53), Hammond, treasurer.

Three new board members were also elected at the meeting. They are: Drs. O. C. Granzin (TEX '45), Baton Rouge (ex-officio); W. L. Trahan (TEX '48), Lake Charles; and W. E. Noel (AUB '54), Lafayette.

s/R. K. MORRIS *President*

North Dakota

NORTH DAKOTA V.M.A. HOLDS ANNUAL MEETING.—The annual meeting of the North Dakota V.M.A. was held June 12-14, 1960, at Fargo, N.D.

Out-of-state speakers at the association's meeting were Drs. James R. Hay, AVMA director of professional relations; Ted Mason, Little Rock, Ark.; Glenn Severin, Fort Collins, Colo.; Max D. Sutter, Kansas City, Mo.; and R. L. Knudson, area director of the Agricultural Research Service, USDA, Washington, D.C.

New officers elected at the meeting are: Drs. Robert C. Reed, Hillsboro, president; D. F. Eveleth, Fargo, vice-president; and Dean E. Flagg, Bismarck, secretary-treasurer and resident secretary.

s/DEAN E. FLAGG, *Secretary*

Deaths

Star indicates member of AVMA

★Ezra W. Newcomer (UP '99), 84, Mount Joy, Pa., died July 4, 1960.

Dr. Newcomer was made an honorary member of the AVMA in 1951. He had maintained a practice at his home since he received his D.V.M. degree. Dr. Newcomer was also a member in the Conestoga Veterinary Club and the Pennsylvania Veterinary Medical Association.

Besides maintaining his veterinary practice, Dr. Newcomer served on the Mount Joy borough school board for 27 years, was a director and secretary of the board of the town's First National Bank and Trust Co., and was a director of the Mount Joy Building and Loan Association.

★J. B. Skelton (IND '16), Riverside, Conn., died Aug. 16, 1960.

Dr. Skelton had retired from practice in July. He was a member of the Fairfield County and the Connecticut V.M.A.'s as well as of the AVMA.

★Archibald C. Tanner (ONT '11), 69, Ottawa, Ont., died July 26, 1960.

Dr. Tanner became a life member of the AVMA in 1956.

Orville G. Wiseman (OSU '24), 61, died of a heart attack Aug. 1, 1960.

Following graduation from veterinary college, Dr. Wiseman moved to Cleveland to establish a practice. In 1949 he moved to Tuscon, Ariz., to retire but opened a practice shortly after his arrival. He had maintained a small animal hospital with his son, Dr. Orville G. Wiseman, III (OSU '56).

John Yost, 87, Beaumont, Texas, died June 26, 1960.

Women's Auxiliary

AVMA Research Fund Campaign District Directors Appointed

District directors for the Auxiliary $75,000 fund-raising campaign for AVMA's research trust fund have been appointed. Acceptances have been received from all of the appointees.

The fund-raising districts coincide with the 12 AVMA Executive Board Districts. District directors are: Mrs. C. E. DeCamp, New York, District I; Mrs. E. L. Symington, Delaware, District II; Mrs. Mark W. Emmel, Florida, District III; Mrs. H. H. Sutton, Kentucky, District IV; Mrs. W. G. Magrane, Indiana, District V; Mrs. C. H. Wetter, Minnesota, District VI; Mrs. R. E. Bogue and Mrs. C. W. Bower, Kansas, District VII; Mrs. A. C. Sears, Texas, District VIII; Mrs. Harry W. Johnson, Colorado, District IX; Dr. Ernestine Payen, California, District X; Mrs. I. W. Vinsel, Montana, District XI; and Mrs. W. G. Stevenson, Ontario, District XII.

The purpose of the campaign is to raise funds for the AVMA Research Fund—the only program sponsored by the profession to supply funds principally for basic research. The trust provides financial aid to qualified veterinarians seeking postgraduate training for careers in research and teaching. Because of limited funds, previous AVMA fellowship grants have been few and small. This year, for example, the AVMA Council on Research could extend grants to only five of 23 qualified candidates. Six awards were granted to renewal applicants, bringing the total number of grants to 11. The grants ranged from $1,300 to $4,725 for the year, depending on the financial needs of the applicant.

Here's How It Will Work

The 12 district directors appointed by the Women's Auxiliary president will be responsible for the campaign in their areas. State and provincial presidents will be asked by the district directors to serve as or appoint a chairman who will oversee fund-raising activities in her area. Local fund raising will be done under the direction of unit captains appointed by the state chairmen. Individual auxiliary members will do the actual fund soliciting. Material to aid auxiliary members in their fund-raising activities will be supplied by AVMA.

Only AVMA members will be approached by the women for contributions since the Research Fund is a professional activity of the Association. Each state has been assigned a financial quota for the campaign based on the number of AVMA members in that state.

The 1961 campaign, scheduled to begin in February, will be the first of a series of annual appeals to the profession.

Six Auxiliary Members Receive Life Memberships

Six veterinarians' wives who have been active Women's Auxiliary members for 40 years were awarded life memberships in the organization at the convention. These women will have all the membership rights and privileges, but will not be required to pay dues. The awards were presented to Mrs. E. C. Eichhorn, Indiana; Mrs. Robert Foster, California; Mrs. Leonard Goss, Ohio; Mrs. Robert MacKellar, New York; Mrs. Edward Records, Nevada; and Mrs. R. S. Stanclift, Kansas.

Student Auxiliary Delegate Tells Convention Impressions

For three years I have heard delegate reports at our auxiliary meetings and for three years I have yearned for the opportunity to be a student delegate to the AVMA convention. This year that dream came true. My husband and I and our student alternates motored off to Fort Collins, Colo., to begin the nicest and most enjoyable trip we have ever taken.

Student delegates and alternates from the student chapters and their auxiliaries met to participate in the preconvention activities which were hosted by the Colorado State University student chapter of the AVMA and its auxiliary on their campus at Fort Collins. Nearly every veterinary school in the United States and Canada was represented.

Upon our arrival, each couple was assigned a room in one of the new student dormatories. We were contacted immediately by the couple who was to be our host during our stay at Fort Collins. We couldn't have been more graciously entertained. The first evening visiting students, their wives, and their hosts partook of an elaborate and delicious

smorgasbord, after which we attended a delegate discussion session. The next day we were hosted to a full day of mountain sight-seeing, complete with a box lunch, eaten amid the splendor of tall pines. The day was climaxed with a barbecue. Audience participation in an Indian Round Dance, taught by real Indian dancers, was a highlight of the evening's entertainment.

After church and breakfast on Sunday, we toured the veterinary school. Dinner was eaten early so we could tour one of the largest feedlots in the United States before our arrival in Denver. Sunday evening the student delegate banquet was served in the grand ballroom of the Denver-Hilton with the pomp and circumstance that might be accorded visiting royalty. Our delegates' meeting after the banquet concluded the preconvention activities, but the convention was just beginning.

We attended the Opening Session, gazed in amazement at all the student auxiliary exhibits, and collected "loot" from the exhibitors' arena. Tuesday the women's activities began. After the delegates' breakfast, we joined the auxiliary delegates for the Opening Session. At this meeting the Honor Roll for student auxiliaries was presented. Three student auxiliaries had perfect honor rolls. We were guests at the auxiliary tea that afternoon and found ourselves wishing the day would soon arrive that we could be members of our state and national auxiliaries. On the final day of the convention we were guests at a luncheon and style show sponsored by the Women's Auxiliary and were given corsages to wear that evening to the AVMA president's inaugural ball.

s/Mrs. Joan Bowen, *student delegate*
University *of Kansas*

A close-up view of the Honor Roll of Student Auxiliary achievements shows that three schools have 100 per cent honor roll records. They are Colorado State, Oklahoma State, and Tuskegee Institute.

Student Auxiliary Delegates, Alternates and Members at Opening Session of Women's Auxiliary in Denver

Twenty-six student Auxiliary delegates, alternates, and members attended the Women's Auxiliary opening session August 15, in Denver. They are shown here under the student honor roll chart which hung behind the speakers' platform during the session.

Illinois

URBANA—STUDENT AUXILIARY HOLDS FAREWELL LUNCHEON.—The wives of senior veterinary students at the University of Illinois were given honorary six-month memberships in the Illinois Veterinary Medical Association Auxilary at a farewell banquet given for them by the Women's Auxiliary of the Student Chapter of AVMA at Urbana, May 9. Mrs. M. L. Kaeberle presented the honorary memberships.

The theme of the banquet, "An International Affair," was carried out in table decorations, music, and a style show of native costumes of Poland, India, and China.

s/MRS. JOHN DICKINSON, *Secretary.*

North Dakota

AUXILIARY ELECTS OFFICERS—The Women's Auxiliary to the North Dakota V.M.A. met June 13, 1960, at the Fargo Country Club for a luncheon and business meeting.

New officers elected for the coming year were: Mrs. D. E. Flagg, Bismarck, president; Mrs. John B. Watkins, Minot, vice-president; Mrs. James L. Bringgold, Valley City, secretary; Mrs. Paul Taba, Linton, treasurer; and Mrs. James D. Vagneur, Jamestown, national convention delegate.

Mrs. T. O. Brandenburg, Bismark, said goodbye to the group because she and her husband planned to leave the state upon his retirement in July. Mrs. Brandenburg was the first president of the North Dakota Auxiliary when it was organized 45 years ago.

The Auxiliary voted to renew pledges to the Research Fund and the Student Loan Fund.

s/MRS. JOHN WATKINS, *Vice-President*

Texas

STUDENT AUXILIARY REVISES CONSTITUTION PROGRAM PLANNING CLAUSE, ELECTS OFFICERS.—A constitution revision to improve the yearly programs of the Texas Student Chapter of the AVMA Auxiliary was planned in May. The constitution will state that programs should be centered around subjects that show the veterinary student's wife how she can best help her husband. Panel discussions, talks by professors from the veterinary school, and explanations of laboratory techniques will all be part of the programs.

New officers elected at the May meeting are: Pauline Hall, president; Nancy McMillan, president-elect; Patricia Schwebel, vice-president; Nancy Denman, secretary; Tricia Bullock, treasurer; Jo Ann Ferrell, parliamentarian; Glenda Sawyer, corresponding secretary, and Shirley Bailey, reporter. Mrs. M. R. Calliham was elected sponsor for 1960-1961 and 1961-1962.

Mrs. C. H. Bridges, far left, and Mrs. R. D. Turk, second from right, visit with two wives of graduates, Mrs. Bob Wilson and Mrs. Jim Howard, both past-presidents of the student auxiliary, at the joint meeting of the Texas student veterinary chapter and the auxiliary in May. Mrs. Guy Ferrell, '61, is serving.

A joint meeting of the student veterinary chapter and the auxiliary in spring was attended by 150. Awards for outstanding accomplishments were presented at the meeting, and the wives of graduates were awarded their Ph.T. degrees.

s/NANCY ELLSWORTH, *President.*

Virginia

Two new officers of the Women's Auxiliary to the Virginia V.M.A. are Mrs. Paul Landis, Norfolk, vice-president (left), and Mrs. George Estes, Richmond, secretary-treasurer.

PREDOMINANT AMONG ANTIBIOTICS

***Chloromycetin*®** (chloramphenicol, Parke-Davis) has a wide range of usefulness and has assumed a position of unusual importance in veterinary therapy.

LARGE ANIMALS		
Calves	Hemorrhagic septicemia (shipping fever)	8 Kapseals ® (250 mg. each) once daily
	Infectious diarrhea (white scours)	2 Kapseals (250 mg. each) orally two or three times daily
Colts and Lambs	Infectious diarrhea Colts	4 Kapseals (250 mg. each) once daily
	Lambs	1 Kapseal (250 mg.) twice daily

SMALL ANIMALS		Chloromycetin dosage per lb. of body weight
Dogs	Gastroenteritis with accompanying diarrhea	25 mg. per lb. once daily
	Urinary tract infections	25 to 75 mg. per lb. daily, in divided doses, at 8-hr. intervals
	Secondary bacterial invaders of canine distemper	75 mg. per lb. daily, in divided doses, at 8-hr. intervals
	Pulmonary infections and other infections due to Chloromysetin-susceptible organisms.	75 mg. to 150 mg. per lb. daily, in divided doses, at 6 to 8-hr. intervals
Cats	Infectious feline panleukopenia	50 mg. twice daily regardless of the size of the cat.
	Pulmonary infections and other infections due to Chloromycetin-susceptible organisms.	75 mg. to 150 mg. per lb. daily, in divided doses, at 6 to 8-hour intervals.

EYE INFECTIONS

When used locally, either as an aqueous solution or in ointment form, Chloromycetin will penetrate an intact corneal epithelium and will not delay its regeneration.

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for calf scours (enteritis)

ENTEFUR® *bolus veterinary, small*

bactericidal action promptly controls symptoms in 93-95%[1,2] of calves

no development of resistant bacterial strains or of cross-resistance

Remissions of calf scours following treatment with ENTEFUR have been of a dramatic nature and uniformly high. In widespread field tests, cure rates of 93% and 95% have been obtained.[1,2]

ENTEFUR is a bolus containing the new antibacterial nitrofuran, FURAMAZONE® (brand of nifuraldezone) 1 Gm., and bismuth subsalicylate 0.26 Gm. for its mildly astringent, antidiarrheal action. FURAMAZONE is a *new* nitrofuran selected for its specific bactericidal activity against gram-negative and gram-positive enteric bacteria, including the virulent strains of E. coli found in calf enteritis.

ENTEFUR is nontoxic even when administered in doses well above therapeutic levels.

Dosage: 1 bolus perorally, twice daily, for 2 or 3 days.

Supplied: Boluses of 3.3 Gm. each, in box of 24.

1. Osborne, J. C. *in* New Horizons in Chemotherapy. Proceedings of First Regional Conference on the Nitrofurans in Veterinary Medicine. In press.
2. Bull, W. S.: N. Amer. Vet. 38: 3 (Jan.) 1957.

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NITROFURANS—a *new* class of antimicrobials—neither antibiotics nor sulfonamides

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WHAT IS YOUR Diagnosis?

Make your diagnosis from the pictures below—then turn the page

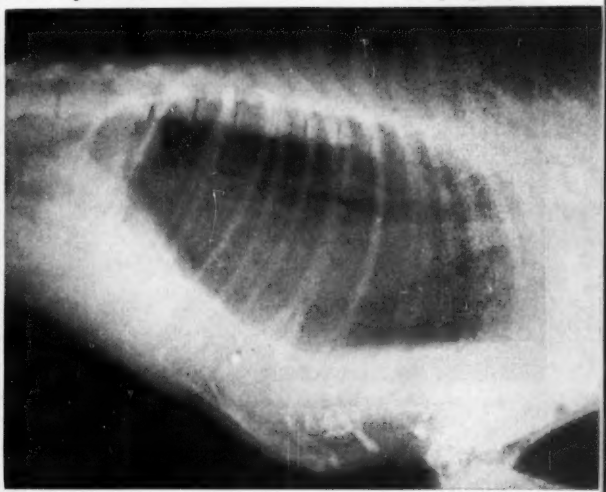

Fig. 1—Ventrodorsal standing radiograph of the Fox Terrier.

Fig. 2—Lateral standing radiograph.

History.—A female Fox Terrier, 5 years old, had developed a "barrel-shaped" thorax and had become less playful than usual during the past 5 months. During the day prior to examination, she became acutely ill; she was dyspneic, cyanotic, and inappetant, and vomited frequently.

Ventrodorsal standing and lateral standing radiographs of the thorax were taken (fig. 1 and 2).

Here Is the Diagnosis

(Continued from preceding page)

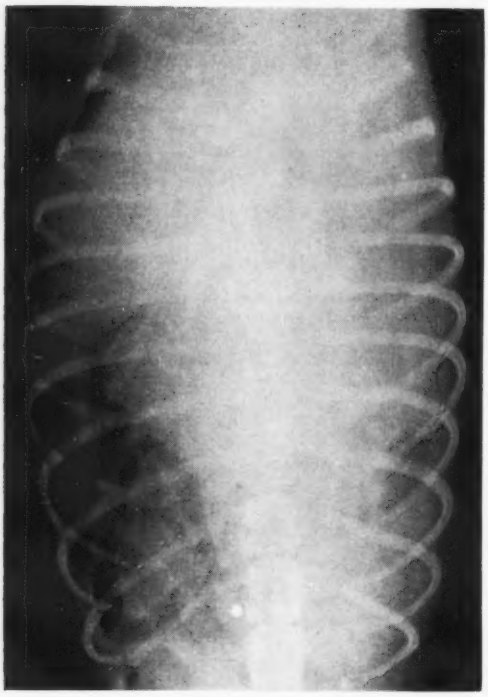

Fig. 3—Ventrodorsal standing radiograph of the dog.

Diagnosis.—Pneumothorax in right pleural cavity and hydrothorax of the left side of the thorax.

Diagnostic Procedure.—An estimated 500 cc. of air was removed from the right pleural space of the dog, and ventrodorsal and lateral standing radiographs were again taken (fig. 3 and 4). An atelectatic lung, a thoracic fluid level, and intestines in the thorax were visible in the radiographs. A diaphragmatic hernia was suspected.

Comment.—After removal of 300 cc. of straw-colored fluid from left side of the thorax, an abdominal operation for diaphragmatic hernia repair was done successfully. No doubt the hernia and resulting displacement of organs were of long standing, but the dog had evidently compensated remarkably well until a spontaneous pneuothorax occurred.

This case was presented by William D. Carlson, D.V.M., Ph.D., Department of Radiology, Colorado State University, Fort Collins, Colo., and prepared with the assistance of Wayne H. Riser D.V.M., M.S., Kensington, Md.

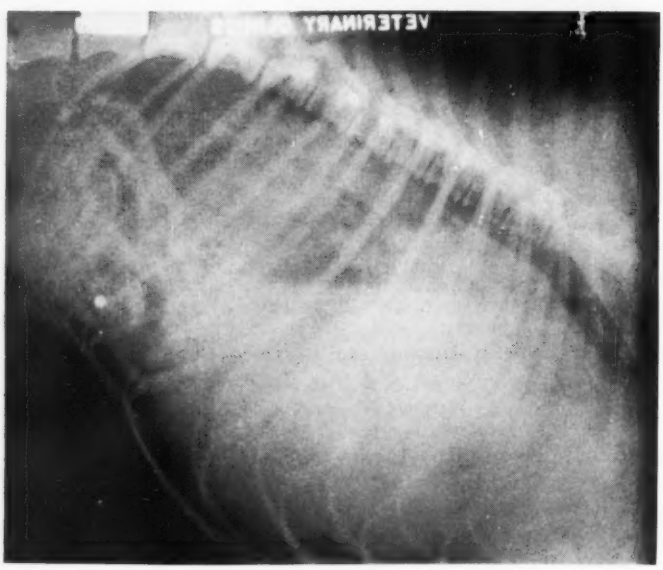

Fig. 4—Lateral standing radiograph showing atelectasis of lung, a fluid level, and intestines in the thoracic cavity.

IN BOVINE MASTITIS

CONSISTENT THERAPEUTIC PERFORMANCE

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BRAND OF NITROFURAZONE

A unique, broad-spectrum antibacterial, FURACIN displays decisive effectiveness against mastitis-inducing organisms often resistant to other therapeutic agents. These include such causative pathogens as Staph. aureus, Str. agalactiae, Str. dysgalactiae, Str. uberis, E. coli and Ps. aeruginosa, sensitive to FURACIN.[1,2]

Given early in acute cases, FURACIN acts to prevent severe, irreversible udder damage of chronic mastitis that usually results in fibrosis and permanent loss of the cow's milk-producing potential. Thus, by reversing clinical signs of acute infection and arresting the process of induration, FURACIN helps maintain the integrity of the duct system and re-establish normal milk production levels.

A large animal practitioner who has made FURACIN his primary antimastitis agent, summarizes its principal advantages:

- it is a professional product
- there appears to be no development of bacterial resistance
- it is milk-miscible, thus, seems to be totally distributed throughout the injected quarter
- it does not interfere with healing
- is compatible with other agents[3]

FURACIN SOLUTION VETERINARY SQUEEJET®

Improved intramammary dosage form of FURACIN in a convenient, low-cost single-dose, ready-to-use dispenser.

Contains FURACIN, 0.2%, in a water-miscible base.
Available in SQUEEJETS of 30 cc., boxes of 12.

Note: Milk from cows treated with FURACIN Solution Veterinary should be discarded or used for purposes other than human consumption for at least 24 hours after the last treatment.

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The broad-spectrum activity of FURACIN is combined with the specific antistreptococcal action of penicillin for additive antibacterial effect.

Contains FURACIN, 2%, and procaine penicillin G (13,333 units per cc.) in peanut oil with aluminum stearate, 3%. In rubber-capped vial of 100 cc., applicator tube of 7.5 cc., boxes of 12.

Note: Milk from cows treated with FURACIN-penicillin Gel should be discarded or used for purposes other than human consumption for at least 72 hours after the last treatment.

References: 1. Kakavas, J. C.; Roberts, H. D. B.; deCourcy, S. J., and Ewing, D. L.: J. Am. Vet. M. Ass. 119:203 (Sept.) 1951. 2. Kakavas, J. C.: Antibiotics Annual 1954-1955, New York, Medical Encyclopedia, Inc., 1955, p. 323. 3. Jackson, R. A.: A Program for Mastitis Control. Read at the Second Regional Conference on the Nitrofurans in Veterinary Medicine, Madison, Wisconsin, May 28, 1959, pp. 23-26.

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Dr. H. B. McGrath Joins Chemagro Corporation

Dr. Harold B. McGrath (COL '44) joined the staff of Chemagro Corporation, Kansas City, Mo., as a research veterinarian.

Dr. McGrath will be responsible for the evaluation of new chemicals being developed by Chemagro Corporation in association with Farbenfabriken Bayer, A.G., West Germany, for use in veterinary practice.

Dr. H. B. McGrath

He was formerly in private practice and is a member of the AVMA, the Colorado V.M.A. and the American Association of Veterinary Parasitologists.

Veterinarian and Feed Man Make "Disease-Free" Pig a Reality

A veterinarian, Dr. B. O. Combs of Conrad, Iowa, and Clifford Green, owner of a feed manufacturing firm, have organized the C and G Laboratories to provide farmers in the area with "disease-free" pigs.

The new firm is housed in a 24- by 64-foot building adjacent to Mr. Green's feed firm and is fully equipped with individual incubators for baby pigs, as well as sanitized brooders. The process of obtaining disease-free pigs followed by C and G is patterned on the technique perfected by the University of Nebraska Experiment Station. Farmers who have sows which are due to farrow can turn them over to C and G and get, at the end of 4 weeks, pigs which are free of atrophic rhinitis and virus pneumonia. To get a disease-free 4-week-old pig from C and G, the farmer currently pays $42 per pig.

From Dec. 14, 1959, through Jan. 13, 1960, C and G raised 131 pigs through the disease-free program. The local packing company processes each sow after hysterectomy.

So far, purebred herd owners are buying the bulk of the pigs that C and G has produced, but local farmers are buying them, too.

The advantages pointed out to potential purchasers of disease-free pigs are the greater feed efficiency obtained, lower mortality rates, and lower cost of production due to freedom from chronic swine disease.—*Feedstuffs, (April 23, 1960): 26.*

Quiz for Quidnuncs

1. From where have our veterinary teaching personnel been obtained in the last 5 years? Page 451.
2. In what activities have the veterinarians awarded advanced degrees in the past 5 years become engaged? Page 450.
3. How many veterinarians are engaged in an organized program of artificial insemination of cattle in this country? Page 456.
4. What important precautions should be considered before making a diagnosis of heart disease in a dog from a radiograph? Page 463.
5. What heart diseases in dogs can be diagnosed fairly readily by radiographic examination? Page 464.
6. What relationship does antibiotic therapy of diarrhea in colts have with Aspergillus infection? Page 481.

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History of the AVMA

1896

At the 1896 meeting in Buffalo, W. H. Hoskins notes in his 1896 presidential address that the depressed economic situation in the past few years "has shown the way to broader fields of labor and opened full wide a domain of usefulness in sanitary work unlimited in scope, where all mankind may reap the greatest benefits, and which will command for us the highest meed of praise and admiration." In this connection he observes: ". . . . training men to minister to the ailments of the lower animals . . . . is an essential and worthy object, [but] the school has a higher purpose—that of demonstrating the relations in which such diseases stand to the welfare of the human family . . . . The day is not far hence when this must be the aim and purpose of every veterinary school in our land."

In a discussion on tuberculosis it was recognized that while "there exists in some quarters a difference of opinion as to the relation of tuberculosis among cattle to the public health . . . . it is the opinion of the United States Veterinary Medical Association that . . . . tuberculosis of man and cattle is identical," and is transmissable through milk from tuberculous cows. Also: "Tuberculin furnishes incomparably the best means of recognizing tuberculosis in the living animal . . . ., [and] is entirely harmless to healthy cattle, and is . . . . exceedingly accurate." At the time, tuberculosis eradication was being hampered by claims that the disease in cattle was not a public health problem, and that the use of tuberculin would infect healthy cows.

The Committee on Army Legislation reported that action on a bill calling for the rank of second lieutenant for army veterinarians had been blocked by a "do-nothing" Congress, and by the Quartermaster-General who maintained "that we should be made civilian employees, hired by contract at so much a month . . . the result of which would make about 20 nice political appointments.

The Committee on Education notes: "Of the 17 schools heard from [of 18], 14 require a three-year course of study; 4 of them required this before the question was agitated by this Association, 1, just established, voluntarily, leaving nine to the credit—are we not right in saying it?—of the earnest efforts of this Association." This left the matriculation examination as "the most important matter that we have to contend with . . . . while the three New York colleges must submit to the Regents' veterinary student certificate . . . . some of them [specify only] reading, writing and spelling; one . . . . while so specifying, allows those who fail to enter upon their professional studies, provided they pass the examination before the beginning of the second year."

In speaking on "Some Experiences in the South," W. H. Dalrymple observes: "Veterinary medicine and surgery, in the more Southern States, are still in their infancy; but through the influence exerted by the reputable graduate the people are beginning to realize the value of intelligent aid in the care and treatment of their animals, in contradistinction to the illiteracy and superstition of the empiric, who is usually in the habit of compounding his mysterious nostrums at certain phases of the moon and performing his so-called operations under similar lunar conditions."

F. H. Osgood was elected president; Sesco Stewart, secretary; and J. L. Robertson, treasurer.

Pictured below is a livery stable in Buffalo about the time of the USVMA meeting there in 1896.

Save blood . . . Save time . . . Save the animal

CONTROL HEMORRHAGE!

A clinical demonstration. Conditions: Standard lip injury with standard instrument. Wound blotted at 15 second intervals. Klot administered 1cc/10 lb. Identical procedure repeated using opposite lip.

Typical blotting paper record (15 sec. intervals). Bleeding time *without* KLOT — 4 min. 15 sec.

Typical blotting paper record (15 second intervals). Bleeding time 10 minutes after administration of one CTD* of KLOT — 1 min. 45 seconds — a 59% reduction.

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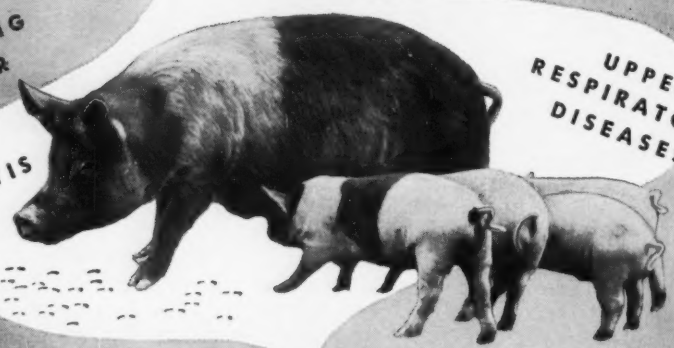

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Niacin	2,270 mgs.
Riboflavin	200 mgs.
Thiamine Mononitrate	200 mgs.
Pyrodoxine HCl	200 mcgs.
Vitamin B_{12} Activity	300 mcgs.
Folic Acid	20 mcgs.
Calcium Pantothenate	250 mcgs.
Choline	20 mcgs.
PACKAGED: 12 1-lb.	$22.50

A new formulation—combines the qualities of expectorant, stimulant, vitamin supplement. Gives all the benefits of guaiacol, ammonium chloride and iodine, plus the replenishing of vitamins. Much more effective than guaiacol alone. Early improvement is marked following treatment for upper respiratory diseases of swine. An excellent supportive treatment for bovine shipping fever and related shipping fever complexes.

Administration is very simple: add to drinking water, and allow no other water during treatment. Mix 1-lb. GWY-VITA to 1-gal. water to make stock solution. *Swine:* ½ to 2 pints of solution to each 25 gallons drinking water. *Cattle:* 1 pint of solution to each 12-15 gallons of drinking water.

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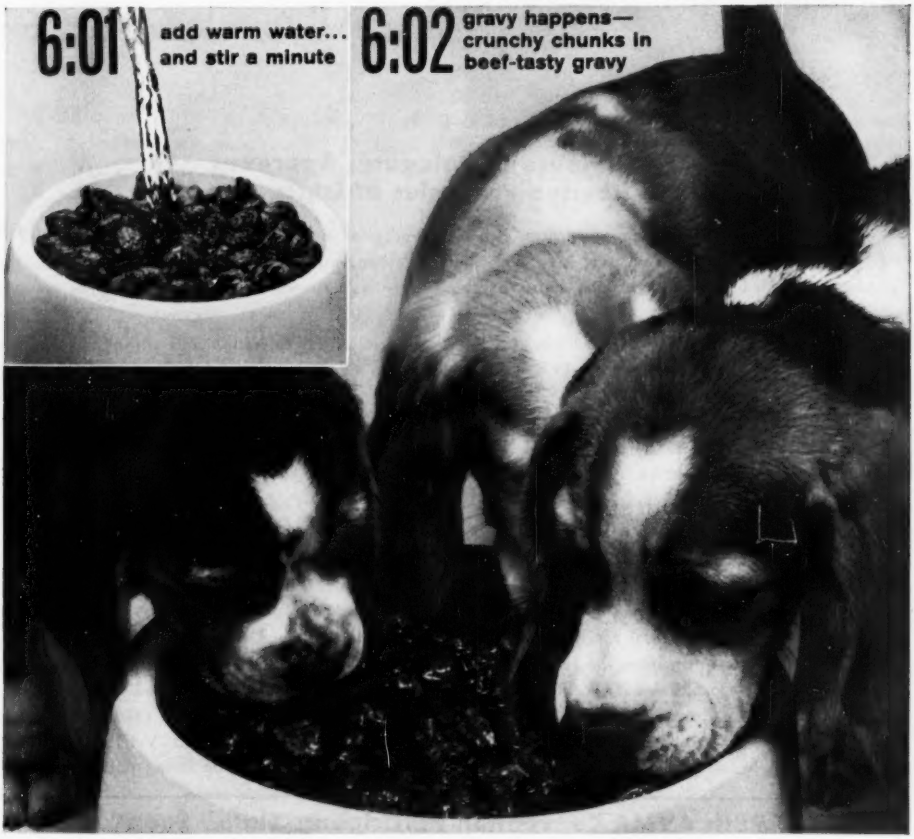

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Gentlemen:

Please send me my Gaines Kennel Plan application blank which explains how I can save $1.50 on every 100 lbs. of Gravy Train or Gaines Meal.

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Offer not good in Kansas or outside U. S. A.

COUNCIL REPORT

AVMA Judicial Council

AVMA House of Delegates Approves Revised Principles of Ethics

Since the Code of Veterinary Medical Ethics was adopted in 1940 (JOURNAL, 96, (1940): 92: 97, (1940): 406–414), there have been few significant changes in its text. On a few occasions paragraphs were added to the Code in an effort to more clearly express the intended meaning of certain sections.

Committees of the Association dealing with the problem of interpretation and enforcement of the Code were constantly faced with the task of rendering opinions on individual questions where the Code was not clearly specific. Many members considered the Code of Ethics as a guide to etiquette and manners among veterinarians rather than a statement of ethical principles.

The Constitution and Bylaws adopted in Philadelphia in 1958 provided for a Judicial Council having jurisdiction on all questions of veterinary medical ethics.

This Council immediately undertook the task of drafting a new Code that would be truly a simple, understandable set of ethical principles.

The most difficult problem facing the Council was to develop a set of simple truths devoid of wordy qualifications; therefore, the Revised Principles of Veterinary Medical Ethics does not attempt to spell out each possible violation of ethical conduct, nor does it contain a list of precise veterinary do's and don'ts.

To aid members and local committees on ethics in obtaining full understanding of this new concept of setting forth ethical principles, the Judicial Council prepared an abstract of previous rulings and interpretations to serve as a practical reference document for the guidance of the individual and the profession. This is contained in the full report of the Judicial Council which will appear in the official proceedings to be distributed to members early in December, 1960. The Revised Principles of Veterinary Medical Ethics, adopted by the House of Delegates, August 13, 1960, are reproduced on facing page.

98th AVMA Convention Participants Slated Soon

Contact your section secretary now if you are interested in appearing on the program of the 98th AVMA Convention in Detroit, Mich., next August. By January, 1961, the section officers will have the program for the Detroit meeting in final shape and will have issued invitations to speakers. Veterinarians who have suggestions to offer or would like to make presentations at the meeting must get in touch with section officers well before then.

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Principles of Veterinary Medical Ethics

PREAMBLE: The honor and dignity of our profession lies in our obedience to a just and reasonable code of ethics set forth as a guide to the members. The purpose of this code is far-reaching because exemplary professional conduct not only upholds honor and dignity, but also enlarges our sphere of usefulness, exalts our social standards, and promotes the science we cultivate.

Briefly stated, our code of ethics is the foundation of our individual and collective efforts.

It is based on the Golden Rule.

Section I

The principal objectives of the veterinary profession are to render service to society, to conserve our livestock resources, and to relieve suffering of animals. A veterinarian should conduct himself in relation to the public, his colleagues and their patients, and the allied professions, so as to merit their full confidence and respect.

Section II

A veterinarian may choose whom he will serve. Once he has undertaken care of a patient he must not neglect him. In an emergency, however, he should render service to the best of his ability. He should not solicit clients.

Section III

A veterinarian should not employ his professional knowledge and attainments nor dispose of his services under terms and conditions which tend to interfere with the free exercise of his judgment and skill or tend to cause a deterioration of the quality of veterinary service.

Section IV

A veterinarian should strive continually to improve veterinary knowledge and skill, making available to his colleagues the benefit of his professional attainments, and seeking, through consultation, assistance of others when it appears that the quality of veterinary service may be enhanced thereby.

Section V

The veterinary profession should safeguard the public and itself against veterinarians deficient in moral character or professional competence. Veterinarians should observe all laws, uphold the honor and dignity of the profession, and accept its self-imposed discipline.

Section VI

The responsibilities of the veterinary profession extend not only to the patient but also to society. The health of the community as well as the patient deserves his interest and participation in nonprofessional activities and organizations.

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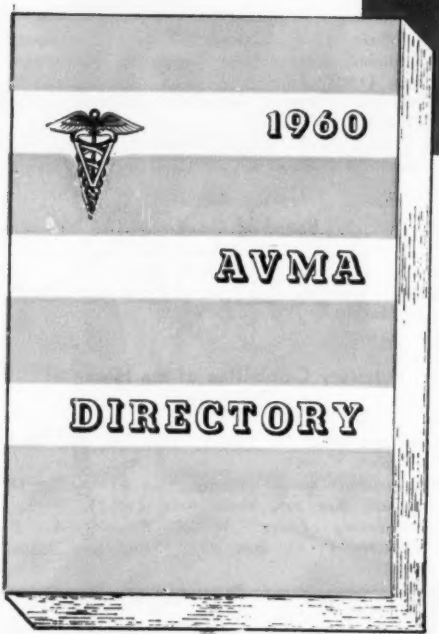

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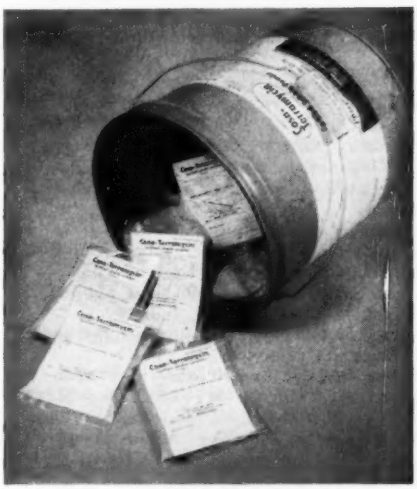

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The library does not lend directly to individuals. Its purpose is to supplement the services of local libraries to which it makes about 6,000 loans a month. The National Library of Medicine will be staffed by 224 persons, 90 of whom are professional librarians, and is responsible for the principal bibliographic medical publications in the United States.

Of interest to book lovers is the magnificent collection of medical manuscripts. Many of the 50,000 items in the library's art collection are original wood cuts, etchings, and oil paintings, and subjects range from alchemy to yellow fever.—*Mod. Med., 28, (July 15, 1960): 44.*

Low Cost Bloat Treatment Featured in Farm Periodical

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Cause of Crooked Calf Disease Studied

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The deformity is found primarily in offspring of cattle grazing in certain alpine ranges in south central Idaho. It has also been known to occur in Montana, Washington, Oregon, Nevada, California, Australia, Canada, and South Africa.—*Agricultural Research, USDA, (July, 1960): 12-13.*

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Beef, and beef by-products are the source of animal protein in Pard, and beef, of course, is synonymous with good protein quality. In addition, both regular Pard and Pard with Beef Gravy contain soy grits, cereals, vitamins and minerals to supply —in just the proper ratio—*all* the nutrients dogs need. In Pard Crunchers, the high protein meat meal is also supplemented with milk, fish, soy, and cereal by-products—to give the same high nutritional value as the canned Pards.

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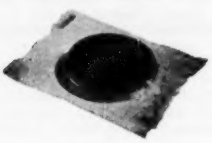
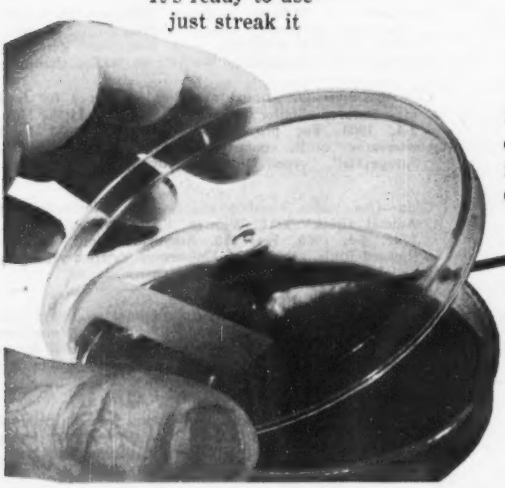
the disposable culture plate
in a sterile bag*



It's ready to use—
just streak it



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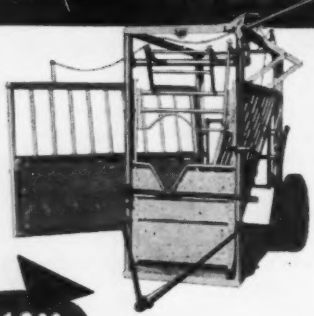

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Coming Meetings

Notices of coming meetings must be received 30 days before date of publication.

New England Veterinary Medical Association. Twenty-sixth annual meeting. Sheraton Biltmore Hotel, Providence, R.I., Oct. 16-19, 1960. L. T. Maloney, New England V.M.A. Consultant, 6 Beacon St., Boston, Mass.

United States Livestock Sanitary Association. Sixty-fourth annual meeting. Daniel Boone Hotel, Charleston, W. Va., Oct. 19-21, 1960. R. A. Hendershott, 33 Oak Lane, Trenton 8, N.J., secretary.

Southern Veterinary Medical Association, Inc. Annual meeting. Francis Marion Hotel, Charleston, S.C., Oct. 23-26, 1960. Otto M. Strock, 461 Maybank Highway, Charleston, S.C., general chairman.

Animal Care Panel. Annual convention. Sheraton-Jefferson Hotel, St. Louis, Mo., Oct. 26-28, 1960. Herbert Graff, 835 S. 8th St., St. Louis, Mo., convention secretary.

American Animal Hospital Association. Regional Meetings. Dr. Frank R. Booth, 3920 E. Jackson Blvd., Elkhart, Ind., executive secretary.

Region 1. Royal York Hotel, Toronto, Can., Nov 2-3, 1960. Roosevelt Hotel, Pittsburgh, Pa., Jan. 15, 1961. Shoreham Hotel, Washington, D. C., Feb. 8-10, 1961. Buffalo Academy of Veterinary Medicine, Buffalo, N.Y., March 16, 1961.

Region 2. Buena Vista Hotel, Biloxi, Miss., Feb. 11-13, 1961. Miami Regional, Miami, Fla., Feb., 1961.

Region 3. Hotel President, Kansas City, Mo., Oct. 20, 1960. Hotel Burlington, Burlington, Iowa, Nov. 16-17, 1960. Commodore Perry Hotel, Toledo, Ohio, Nov. 30, 1960.

Region 4. Oklahoma State University, Stillwater, Okla., Jan. 22, 1961. Texas V.M.A. Meeting, Houston, Texas, Jan. 30, 1961. Colorado State University, Fort Collins, Col., Feb. 19, 1961.

Region 5. Desert Inn, Las Vegas, Nev., Oct. 23-25, 1960.

Conference of Public Health Veterinarians. Annual meeting. San Francisco, Calif., Oct. 30-Nov. 3, 1960. Dr. Joe W. Atkinson, National Institutes of Health, Laboratory Aids Branch, ARS, Bethesda, Md., secretary-treasurer.

Association of Military Surgeons. Sixty-seventh annual convention. Mayflower Hotel, Washington, D.C., Oct. 31-Nov. 2, 1960. Brig. Gen. J. A. McCallam, Veterinary Section, U.S. Army, ret., Washington, D.C., chairman.

Cornell University. Annual nutrition conference for feed manufacturers. Statler Hilton Hotel, Buffalo, N.Y., Nov. 2-4, 1960. For programs, preregistration and hotel reservation cards, contact: Prof. Harold H. Williams, Savage Hall, Cornell University, Ithaca, N.Y., chairman.

Ohio—Orthopedic Worshop and Seminar. Northern Hills Animal Clinic, 9211 Winston Rd., Cincinnati, Ohio. Nov. 4-6, 1960. Fee, $50. Attendance limit, 14. Dr. Richard Rudy, Ohio State University, Veterinary Surgery and Radiology, Columbus, Ohio, chairman.

Missouri, University of. Thirty-sixth annual veterinary conference. University of Missouri, School of Veterinary Medicine, Columbia, Mo., Nov. 7-8, 1960. Cecil Elder, School of Veterinary Medicine, Veterinary Pathology, University of Missouri, chairman.

Arizona Veterinary Medical Association. Annual meeting. Safari Hotel, Scottsdale, Ariz., Nov. 13-15, 1960. Elmer B. Powell, 1102 S. Scottsdale Rd., Scottsdale, Ariz., local arrangement (phone—WH 5-6479).

(*Continued on adv. p.* 50)

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ORAL SUSPENSION VETERINARY

FOR EQUINE TRACHEOPHARYNGITIS AND URINARY TRACT INFECTIONS

With DANTAFUR, the therapeutic usefulness of the modern broad spectrum antibacterial, nitrofurantoin, has been extended to the specific treatment of *equine tracheopharyngitis* and *urinary tract infections.*

A completely new oral dosage form, DANTAFUR provides: greatly increased nitrofurantoin concentration ■ enhanced bactericidal effectiveness to include such refractory pathogens as beta hemolytic Streptococcus sp. and Pseudomonas sp., and ■ convenience in dosing the thoroughbred afflicted with "race track cough".

A preliminary field study, in which DANTAFUR was used to treat thoroughbreds with tracheopharyngitis, yielded excellent results. Recovery was obtained in 94% of the cases. Complete relief of signs of coughing and nasal discharge was followed by early return to normal breathing. Average duration of treatment was 6 days. Recurrences were minimal.

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REFERENCES: Teigland, M. B.: Proceedings of the 4th Annual Meeting, Amer. Assn. of Equine Pract., Chicago, Illinois, 1959. Witter, R. S.: Paper read at the Third Regional Conference on the Nitrofurans in Veterinary Medicine, Atlanta, Georgia, January 14, 1960.

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(*COMING MEETINGS—continued from adv. p.* 48)

Midwest Small Animal Association. Hotel Burlington, Burlington, Iowa, Nov. 16-17, 1960. Dr. J. Porter Coble, 2828 S. MacArthur Blvd., Springfield, Ill., secretary.

American Association of Equine Practitioners. Annual meeting. Westward Ho Hotel, Phoenix, Ariz., Dec. 12-14, 1960. Dr. M. B. Teigland, 2560 State Service Rd., Opa Locka, Fla., secretary-treasurer.

Veterinary-Nutrition Conference. Sponsored by Midwest Feed Manufacturers Association and Iowa, Kansas, Missouri, Oklahoma, and Nebraska Veterinary Medical Associations. Continental Hotel, Kansas City, Mo., Dec. 12-13, 1960. Dr. James Bailey, Walnut Grove Products Co., Atlantic, Iowa, chairman.

American Veterinary Radiology Society. Mid-year meeting. Hotel Severin, Indianapolis, Ind., Jan. 10, 1960. Dr. J. J. Fishler, 3421 S. Main St., Elkhart, Ind., secretary.

Intermountain Veterinary Medical Association. Thirty-third annual meeting. Newhouse Hotel, Salt Lake City, Utah, Jan. 11-14 1961. Mr. Peter B. Woolley, 306 Ness Building, 28 West Second South, Salt Lake City, Utah, manager.

Kansas Veterinary Medical Association. Fifty-seventh annual convention. Broadview Hotel, Wichita, Jan. 15-17, 1961. Dr. M. W. Osburn, Kansas State University, Division of Extension, Manhattan, Kan., secretary-treasurer.

Wisconsin Veterinary Medical Association. Forty-fifth annual meeting. Schroeder Hotel, Milwaukee, Wis., Jan. 15-17, 1961. W. J. O'Rourke, 540 W. Washington Ave., Madison 3, Wis., secretary.

Arkansas Veterinary Medical Association. Annual meeting. Hotel Marion, Little Rock, Jan. 22-24, 1961. Thayer D. Hendrickson, 7824 Cantrell Rd., Little Rock, Ark., secretary-treasurer.

Minnesota Veterinary Medical Association. Annual meeting. Leamington Hotel, Minneapolis, Minn., Jan. 23-25, 1961. B. S. Pomeroy, 1443 Raymond Ave., St. Paul 8, Minn., secretary.

Ohio State Veterinary Medical Association. Annual meeting. Commodore Perry Hotel, Toledo, Ohio, Feb. 5-8, 1961. Dr. R. E. Rebrassier, 1411 West Third Ave., Columbus 12, Ohio, executive secretary.

Missouri Veterinary Medical Association. Sixty-ninth annual meeting. Hotel Statler-Hilton, St. Louis, Feb. 19-21, 1961. Paul L. Spencer, D.V.M., P.O. Box 283, Jefferson City, Mo., secretary.

(*Continued on adv. p.* 52)

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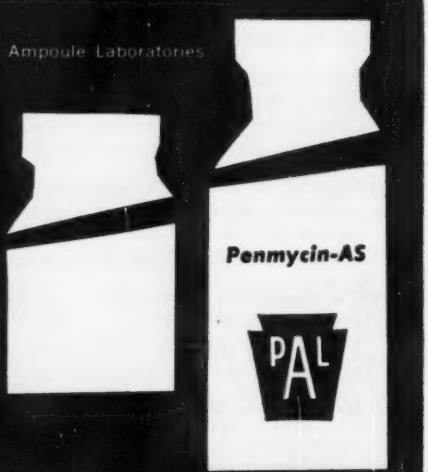

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KEN-L-BISKIT... with more usable nourishment in every cup!

Every cup of Ken-L-Biskit can *do* more to create the peak condition, the wonderful spirit and energy of a champion.

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(*Continued from adv. p.* 50).

Foreign Meetings

Fourth International Congress on Animal Reproduction. The Hague, Netherlands, June 5-9, 1961. For additional information contact: the Secretariat of the Fourth International Congress on Animal Reproduction, 14, Burgemeester de Monchyplein, The Hague, Netherlands, Dr. L. Hoedemaker, secretary to the organizing committee.

Eighth International Congress of Animal Husbandry. Hamburg, Germany, June 13, 1961.

Twelfth World's Poultry Congress. Show Grounds of the New South Wales Royal Agricultural Society, Sydney, Australia, Aug. 13-18, 1962. Dr. Cliff D. Carpenter, chairman, U. S. Participation Committee, 1207 Emerald Bay, Laguna Beach, Calif.; Dr. A. William Jasper, secretary, c/o AFBF, 2300 Merchandise Mart, Chicago 54, Ill.

AVMA Research Fellowships Available

The Council on Research of the AVMA announces the availability of a number of fellowships for postgraduate training for the academic year, 1961-1962.

The recipient of a fellowship must be a veterinarian and a citizen of the United States or Canada. Veterinary students who expect to graduate at the end of the current school year and who wish to follow a career in research may apply for a fellowship.

It is advisable that completed application forms be filed by Jan. 1, 1961, to allow time for correcting omissions and for some reasonable delay in arrival of letters of information from third parties. The latest date for filing the completed application is Feb. 1, 1961. Approximately one month is required for processing completed applications after receipt by the Council. Qualified persons should secure and submit applications as early as possible to insure their file being complete for presentation to the Committee on Fellowships.

The Committee on Fellowships of the Council on Research will meet early in March to consider applications and the awards will be announced soon afterward. The stipend will be determined in each case by the needs of the individual, the location of the school in which he proposes to work, and other factors. In general, the stipends range from 100 per month upward. Any qualified person interested in graduate training may obtain application blanks and other information from the deans of the various colleges of veterinary medicine or by writing to the Council on Research, American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill.

MSU Medical Technology and Veterinary Students Closely Combined

The College of Veterinary Medicine at Michigan State University is unique among American veterinary colleges in that it administers a School of Medical Technology. This combination seems incongruous to some who fail to see any connection between training veterinarians and training medical technologists for human hospitals, but the association has worked well for more than 30 years and MSU "med techs" are considered to be among the finest in the country.

The 2 professions, joined by administrative organization in 1927, have some mutual objectives: the continued raising of academic standards, the recruitment of more able students, and the promotion of greater public understanding and appreciation.

There are no ethical obstacles to such association. Each profession has its code of ethics, and the 2 are entirely compatible.—*MSU Vet., 20, (Winter, 1960): 57.*

Dr. Scheidy Greets French Veterinary Graduates

Dr. Samuel Scheidy (center), past-president of the AVMA and veterinary medicine director at Smith Kline & French Laboratories in Philadelphia, welcomes a group of 40 recent graduates of the Ecole Nationale Veterinaire in Alfort, France. The students, on a month-long tour of Eastern veterinary schools and research centers, toured the SK&F plant and SK&F's Norden Laboratories. Students visited Washington, D. C., Lexington, Indianapolis, Chicago, Kalamazoo, Ithaca, Montreal, and Guelph, Ont. before returning to France in late July.

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For effective immunization of hogs against Hog Cholera
RV (Hog Cholera Vaccine, Rabbit origin)
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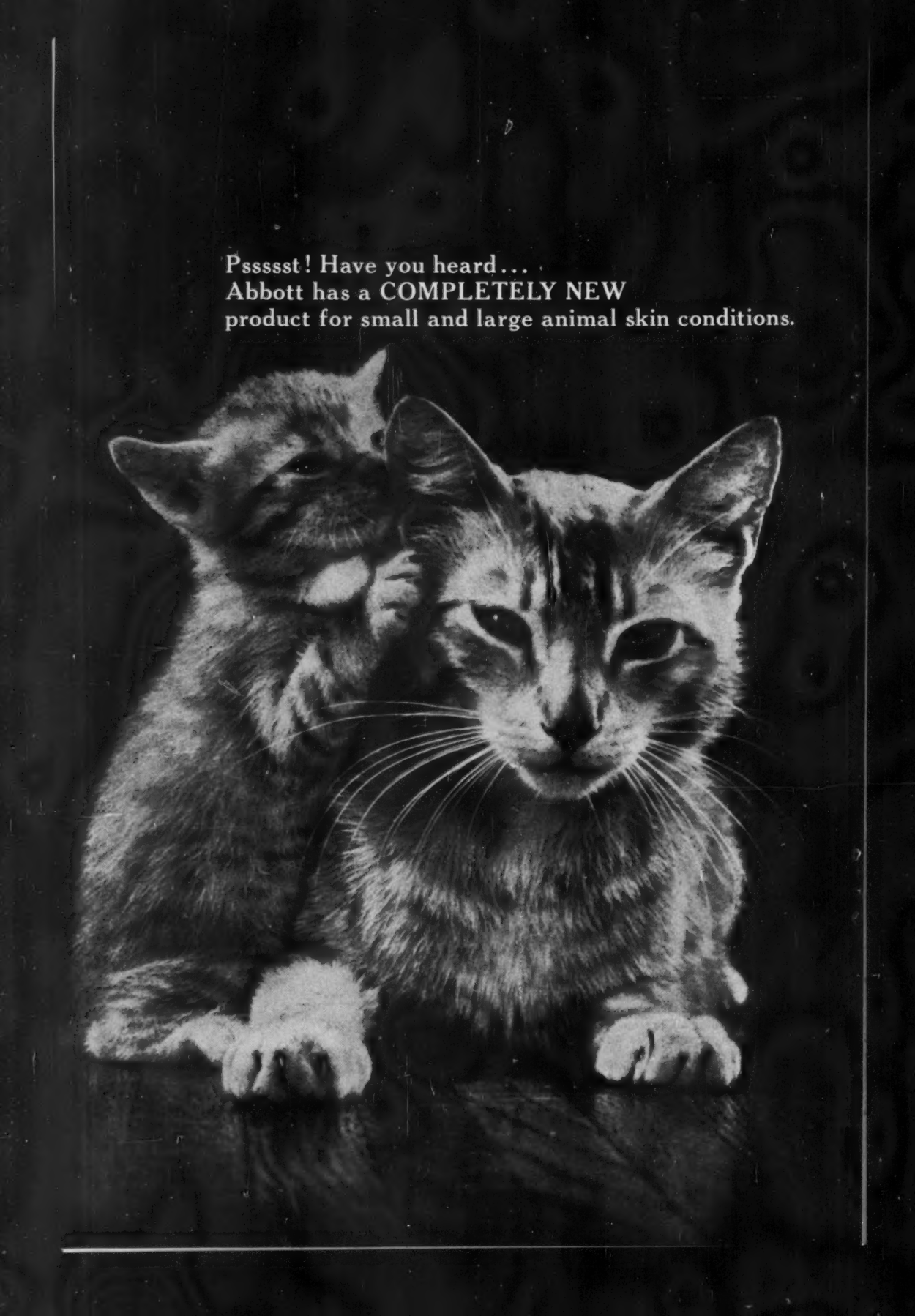
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Abbott has a COMPLETELY NEW
product for small and large animal skin conditions.

Dioleen SUSPENSION AND CREAM

TRADEMARK (DIIODOHYDROXYQUIN, ABBOTT)

From Abbott Laboratories...a highly effective new treatment for common small and large animal skin conditions.

What is Dioleen Suspension?
Dioleen is a suspension of 5% w/v diiodohydroxyquin, U.S.P., in an aqueous base, with a detergent to facilitate lathering and rinsing. It is *non-toxic*, scented with lavender, and easy-to-use.

What are the indications for Dioleen Suspension?
Dioleen Suspension is indicated for the treatment of contact and allergic dermatitis, nonspecific dermatitis, hot spots, fungus infections, and as an aid in the removal of ectoparasites.

How effective is Dioleen Suspension?
Reports from clinical investigators indicate Dioleen provided effective control in upwards of 90% of the animals treated for allergic dermatitis, fungus and hot-spots, moist and summer eczema . . . usually in only one or two applications.

Marked improvement was noted after two or three treatments in patients suffering from infestations of fleas, lice, and mange mites.

Dioleen is often effective where other products have not succeeded. Investigators reported no case of sensitivity.

DIOLEEN CREAM

What is Dioleen Cream?
Dioleen cream contains 5% w/w diiodohydroxyquin, U.S.P., in a water miscible, greaseless vanishing cream base. It is lightly scented and light tan in color. It is designed for "spot" or local application to severely affected skin areas in large and small animals. May be used concurrently with Dioleen Suspension therapy.

How effective is Dioleen Cream?
Clinical reports indicated favorable control of fungus-like infections, allergic dermatitis, hot spots, recurrent dermatitis, and flea bites in at least 80% of the cases studied. Results are usually seen in one to three applications. No side effects have been noted in clinical trials.

Dioleen Cream for Large Animals
In diverse large animal skin conditions—ringworm, eczema, and lesions resulting from cow-pox, chapped teats, and soreness at the base of the udder—Dioleen cream brought all cases studied under control in one or two applications.

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Dioleen Suspension—in 6 fl. oz. bottles, pints and gallons. List No. 8713
Dioleen Cream—in 1 oz. tubes and 1 pound jars. List No. 8702
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COMMERCIAL WANT ADS—$5.00 for the first 25 words, 25 cents for each additional word; $1.00 for use of box number. (See paragraph above for total word count.)

Remittance must accompany ad.

DEADLINES

1st of month issue — 8th of month preceding date of issue.

15th of month issue — 22nd of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the box number, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be sent to the advertiser.

Wanted—Veterinarians

Wanted—veterinarian to assist owner of AAHA member hospital in Chicago. Apartment available. State qualifications and salary desired. Address Box K 64, JOURNAL of the AVMA.

Wanted—associate veterinarian for mixed practice in southern Indiana. New small animal hospital. Address Box K 62, JOURNAL of the AVMA.

Wanted—experienced veterinarian for mixed practice in southern California. Excellent opportunity for right man. Address Box K 67, JOURNAL of the AVMA.

Associate wanted for busy mixed practice in the Southwest. Address Box K 61, JOURNAL of the AVMA.

Associate veterinarian wanted in active large animal practice in Alberta, Canada. Give age, experience and initial salary expected. No provincial board examinations required in Alberta for graduates from accredited colleges. Address Box K 60, JOURNAL of the AVMA.

Wanted—veterinarian for disease control work in New Jersey. Salary range—$6,366 to $8,274. Annual increments. Civil service with liberal pension and social security benefits. Address Director, Division of Animal Industry, New Jersey Dept. of Agriculture, Trenton 25, N. J.

Wanted—The Agricultural Division, American Cyanamid Company, is seeking a veterinarian with 2 to 5 years' experience for the position of regional technical service representative in the Southwest Region with headquarters in Dallas, Texas. Responsible for promotion and service of technical programs. Address Personnel Relations, Agricultural Division, American Cyanamid Company, P. O. Box 672, Princeton, N. J.

Wanted—assistant veterinarian for active small animal hospital in San Francisco area. Must have ambition and initiative. Good salary, ultimate profit participation possible. Address Box K 52, JOURNAL of the AVMA.

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Progressive pharmaceutical organization, has available an excellent opportunity for a young veterinarian as an assistant to the section head in an expanding veterinary clinical research section.

Background in animal and/or poultry husbandry. Travel will be required in contacting veterinary and agricultural colleges, practitioners, feed mills, etc.

Excellent suburbal North Jersey location near N.Y.C. Liberal company benefit programs. Please submit resume listing detailed qualifications and salary requirements.

Address Box K 53, JOURNAL of the AVMA.

Wanted—assistant veterinarian for small animal practice. State qualifications and salary requirements. Connecticut license required. Address Drs. M. H. Rayn and R. A. Rands, Davis Animal Hospital, West Main St., Stamford, Conn.

Wanted—recent graduate to assist in modern, well-equipped small animal hospital. Some large animal. Located in large southern city. Salary commensurate with ability. Address Box K 51, JOURNAL of the AVMA.

Wanted—veterinarian to supervise experimental animal facility at the University of Texas Southwestern Medical School. Applicant must have supervisory and executive ability. Experience in laboratory animal medicine desirable. Must qualify for Texas license. Presents excellent opportunity to do institutional research. Salary open. Submit curriculum vita to Animal House Committee, c/o Dr. Donald Wiggans, Dept. of Biochemistry, Southwestern Medical School, 5323 Harry Hines Blvd., Dallas 35, Texas.

Wanted—assistant veterinarian for mixed practice, predominantly small animal, in Indiana. Salary, percentage and future. State age, qualifications, references and availability. Address Box K 16, JOURNAL of the AVMA.

Wanted—assistant for active modern small animal hospital on Long Island, near New York City. Good opportunity with excellent future. State qualifications. Address Box J 51, JOURNAL of the AVMA.

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Wanted—experienced kennel man or woman, steady position, free living quarters, in Baltimore, Md. Address Box K 58, JOURNAL of the AVMA.

Wanted—veterinarian for small animal practice in Los Angeles area. California license required. Write or call Dr. Robert L. Mercer, 1120 W. Manchester, Inglewood, Calif. ORegon 8-8802 or ORchard 3-0057.

Wanted—Positions

Small animal relief veterinarian available for vacation coverage during October and November. New York City and Long Island only. Address Box K 55, JOURNAL of the AVMA.

For Sale or Lease—Practices

For sale—well-established southern Wyoming mixed practice, 80% large animal. Sale includes 10 lots, combined clinic for large and small animals, equipment. No other veterinarian in county. Address Box K 59, JOURNAL of the AVMA.

For sale or lease, with option to buy—unusual opportunity for veterinarian licensed in Maryland to take over small animal practice grossing large return. Address Box K 56, JOURNAL of the AVMA.

For sale—Colorado 2-man practice with small and large animal hospital, fully-equipped. 2 veterinary wagons. Gross—$70,000 to $120,000 last 10 years. Net—$30,000 in 1959. Sizeable down payment needed. Address Box K 63, JOURNAL of the AVMA.

For sale or lease—small animal hospital and residence in northern Ohio. Established 15 years. New hospital. Must have $10,000 to handle. Address Box K 65, JOURNAL of the AVMA.

For sale—general practice, house and office in central Minnesota. 1959 gross over $30,000. Unlimited possibilities for 1 or 2 veterinarians. Address Box H 51, JOURNAL of the AVMA.

For sale—progressive Pennsylvania small animal practice. Ready to walk in and gross $25,000. Rapidly growing. $10,000 will handle. Will sell for real estate value at $35,000. Address Box K 57, JOURNAL of the AVMA.

For sale or lease—new home and small animal hospital in southern Michigan. 70% large animal. Address Box K 54, JOURNAL of the AVMA.

For sale—small animal practice and hospital in South Carolina. Price—real estate and inventory. Other interests, $5,000 to handle. Address Box K 50, JOURNAL of the AVMA.

For sale—Illinois mixed practice, established 9 years and still growing, 15% small animal. Will sell for value of real estate: drugs and equipment optional. Address Box K 1, JOURNAL of the AVMA.

For sale—established small animal hospital located on north shore of Long Island. Average gross for past 5 years more than $100,000. Strategic location in growing area. Fully-equipped for X-ray, surgery, laboratory work. Address Box K 8, JOURNAL of the AVMA.

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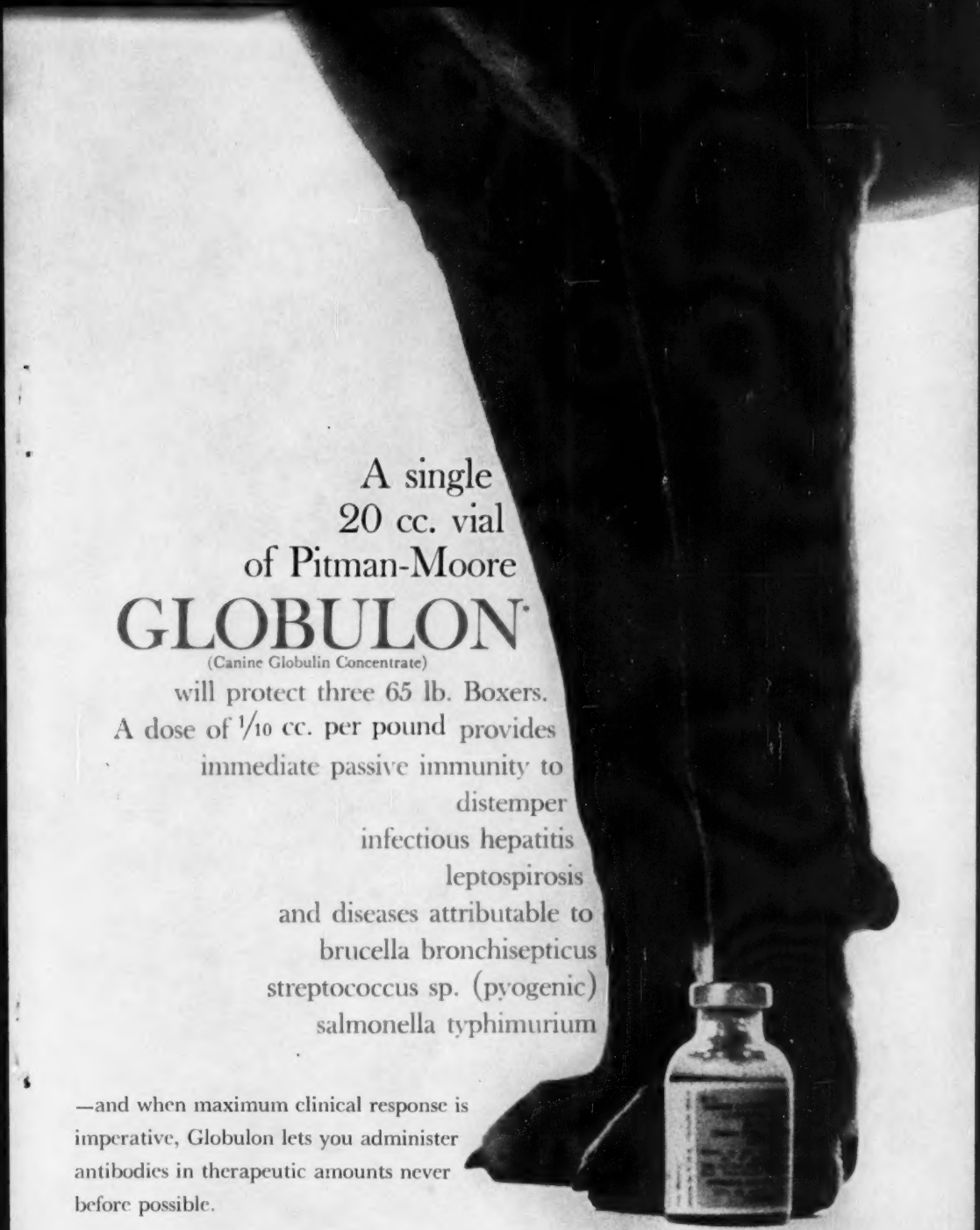

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